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AGRICULTURAL MARKETING IN INDIA

सत्यमेव जयते

REPORT ON THE

MARKETING OF MEAT
IN
INDIA

DIRECTORATE OF MARKETING AND INSPECTION

MINISTRY OF FOOD AND AGRICULTURE
GOVERNMENT OF INDIA

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Report on the Marketing of Meat in India

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Preface

This publication is in continuation of the series of the Marketing Surveys of the Directorate of Marketing and Inspection. This is the 28th report in the series of Surveys on live-stock and live-stock products. It is well known that production and marketing of meat in India are haphazard and take place under unhygienic conditions and there is lot of wastage of by-products.

Meat is of vital importance to the Indian population because their diet is deficient in first class proteins and this could easily be obtained from meat. Therefore, from economic, nutritional and public health points of view, meat industry is of considerable importance to the country and deserves a lot more of attention than it has received in the past.

In the Parliament every now and then questions are asked for the supply of data and statistics on meat production, number of different types of animals slaughtered, their yield, imports and exports, etc. As no reliable information was readily available on all these aspects, it was found necessary to make an all-India Survey and bring out this report to meet the need and demand of the country.

The report contains four chapters; dealing comprehensively with all aspects of meat industry, *viz.*, production, inter-State trade, imports and exports, utilization, prices, preparation for the market, preservation, assembling and distribution, etc.

Summary, conclusions and recommendations are given in the last Chapter.

Important recommendations have been made in respect of how production can be increased, appointment of Central Slaughter-House Committee to go into planning of slaughter-houses suitable for Indian conditions and to frame model rules for the operation and control of slaughter-houses and meat inspection. The report discusses at length the re-organisation of meat industry and how to train meat inspectors in order to meet the demand, on account of short supply of veterinarians in the country. The report forms a very valuable reference book for corporations, municipalities and others connected with slaughter-houses and their control as it contains bye-laws relating to markets and slaughter-houses made by chief corporations in India and model rules for meat inspection and for the inspection of slaughter-houses and their inspection.

This publication has become possible through the co-operation of the Director of Animal Husbandry and Veterinary Services of the States and State Marketing Officers who supplied as much data and information on the subject as they possibly could. Thanks are due to them.

Thanks and acknowledgements are also due to a large number of producers, merchants, processing concerns, States and the Central Government Departments and others who kindly extended assistance and co-operation in carrying out the survey.

The Government of India should not be regarded as assuming responsibility for any statements contained in the report.

The report was compiled by Shri L. M. Hira, Marketing Officer under the guidance of Shri H. S. Bawa, Senior Marketing Officer of this Directorate.

M. B. Ghatge

Agricultural Marketing Adviser

to the Government of India

Report on the Marketing of Meat in India

CHAPTER I—SUPPLY AND UTILIZATION

(1) General

Meat has been known to the human race since time immemorial. Primitive man chose it instinctively if not through necessity. At first, it was a matter of securing meats from the wild animals; later, animals were domesticated and eventually used for power and recreation as well as for food and clothing. Thus, down through the ages, with each succeeding step in his advancing civilization, man became more and more dependent upon animals and animal products.

The oldest data in the history of meat inspection are the food ✓ edicts of the Egyptians which designated certain animals, the hog above all, as unclean, and excluded their meat as food for man. Mighty Kings of Assyria and Egypt decreed that the slaughtering of animals for food should be performed only by the priests. During the reign of the Ptolemies, stringent food laws covering the preparation of meat for consumption were rigidly enforced. The flesh of the kid was highly esteemed by Jews who sacrificed goats as offerings to Jehovah. In the middle Ages, powerful butcher guilds were organised in most of the large cities of Europe, and for centuries, represented a significant influence in the life of a community. The Worshipful Company of Butchers of London, England, was founded in 1180 and continued to be a power for several centuries. Statutes on the "Profession of butchering" were made in France in the Middle of the same century.

In contrast to the views regarding the meat foods of the Semitic races stand those of the old Greeks and Romans. Pork was not interdicted but was greatly favoured by the Romans. The salting of meat, which is mentioned by Homer, was known to the Romans, as was also the preparation of various kinds of sausages and smoked products. Well-equipped abattoirs and meat markets existed, according to Ostertag in ancient Rome.

Mohammadan food regulations, even of to-day, are similar to the Israelite and Egyptian food laws. The "Korean" considers both the hog and the dog as unclean.

In India, cow is considered as sacred and almost worshipped. To kill a cow or a bullock is a deadly sin in Hinduism. It is recorded that even the Moghul King, Baber, had issued a "Royal Farman" banning the killing of cows throughout his kingdom.

During the early part of the nineteenth century, the extraordinary expansion in the use of machinery in Europe and in America and the improved means of transportation gave meat industry an unprecedented stimulus which resulted in the development of industrial centres of huge population. As these cities increased in population there grew up a huge demand for meats—a demand that has gone on increasing in volume until, in recent years, it has become the third ✓ biggest industry in America, the motor industry ranking first.

(2) Importance of meat as food

Long before science learned about vitamins and balanced diets, the "Meat eating nations" were recognised as the successful, dominant nations of the globe. It is now known that meat, fish and dairy products are the best source of dietetic elements essential to vigorous health. Proteins are essential building materials of the body, indispensable to proper growth, repair and good health. Meat supplies proteins of high quality and ready digestibility.

Meat is also an important source of fat, a great energy—producing food. Lean meats, since they are nutritious but furnish only modest amounts of calories, are recognised as especially important in the non-fattening diet. The fatter meats, however, are very rich in calories. Meats such as bacon and salted pork are among the richest of all foods in energy contents.

Meat is an excellent source of iron and phosphorous and supplies in good quantity most of the other minerals needed by the body. Most of the vitamins also are found in meat, some in modest amounts only, but others, such as riboflavin (Vitamin G) and in the case of lean pork, thiamin (Vitamin B^1) are supplied abundantly.

Parts of the animal body, such as the liver, kidneys, heart, tongue, thymus and pancreas are excellent sources of both proteins and minerals and, in addition, are rich in many vitamins.

In practically all the slaughter houses and meat packing establishments in the United States of America and other foreign countries, the utilization of edible and non-edible offals has become an industry in itself. This greater utilisation of the by-products has made it possible to pay the producer an increased price for the livestock purchased and to sell the finished product to the consumer at a cheaper price. With the development of fertilizer and other by-product industries the greater part of the previously wasted material is now utilized in those countries to great advantage.

A large number of valuable miscellaneous products used in medicines are also manufactured from parts of animal body, such as glands, etc. Some important products are Pepsin, Pancreatin, Adrenalin, Pitutrin, Insulin, Haemo-globin, Thyroid extract, etc. Pepsin aids digestion, while Pancreatin is used for peptonising food for infants and invalids. Adrenalin is an expensive medicinal product obtained from adrenal glands and is a powerful heart stimulant.

If we look at the livestock census of India and the amount of slaughtering that takes place, it can be safely said that we can meet all the demands for glandular products. Such a demand for glandular preparations is increasing at a tremendous pace all over the world.

Unfortunately in India meat has not yet received sufficient recognition as an important food item and has hitherto been regarded as a luxury chiefly for the town-dwellers. There is an ample scope of research and development of this aspect of the industry in this country, but this potentiality is not being fully utilized for want of cold storage and other facilities which are so very essential for preserving the glands etc. from the time of slaughter to the time of removal to the factory.

In all progressive countries of the world, foremost attention has been given towards securing an adequate supply of meat to the population and the whole business of meat production, marketing and utilization has been developed into a great national industry embodying the latest advances in scientific knowledge. On the one hand, extensive propaganda is being carried on for educating the people on the need for increased consumption of meat products in their daily diet; on the other side, organised efforts are made for improving the production of meat and safeguarding its healthfulness and wholesome food value with a view to enabling the people to obtain more and better meat. As a result, there is now no branch of human activity in which science has wrought more beneficial changes than in the production and marketing of meat, and meat hygiene constitutes one of the conspicuous developments in the science of public health.

It is also interesting to note how live animals and their respective meats came to be designated as we know them to-day. The story is that after the Norman conquest of England, the language of the Court, or that used by what may be called the "polite set", was Norman-French. But the common people, the keepers of the herds and flocks, continued to speak their native Middle English dialects. These native underlings referred to the live animals under their charge as Kine, Calves, Swine and Sheep; and when the servants set the different meats before their feudal masters, they used the names of "Boeuf", "Vielle", "Porce", and "Mutton"—names which later became established as beef, veal, pork and mutton. Gradually, as the two nationalities of England fused, the names of the animals and their respective meats became an established part of the English language.

A—Note on world production and international trade in meat*

Introduction.—World meat production and trade have undergone many changes during the past ten years, but the effects of the war have been far from uniform in different areas and for different classes of meat. Generally speaking, meat production in Europe was, in the aggregate, heavily reduced but there was an increase in output in the Western Hemisphere in response to war-time needs, and production in the Southern Dominions was at least fully maintained. Again, while international trade in carcase beef was severely reduced, exports of mutton, lamb and pig meat increased, and the canning industry was expanded to meet the special needs of the belligerent nations. There was thus both a reduction in European trade (before the war largely concerned with the export of pig meat to the United Kingdom market) and a large increase in shipments from trans-Atlantic sources of supply in North and South America, acute shipping difficulties at certain times limited the volume of supplies from Australia and New Zealand. In the post-war period, recovery in Europe, hindered by many difficulties, has been slow while in several non-European exporting countries output has fallen below the high levels attained during the war.

Almost 90 per cent. of the world meat is consumed in the regions where it is produced and hardly 10 to 12 per cent. enters international trade. International trade in meat is very important to a few countries that have specialized in production for export, *e.g.,* New Zealand, Denmark, Argentina and Australia. It is also vitally important to the United Kingdom whose imports of meat are considerably greater than its indigenous production. The bulk of international trade in meat is conducted through bilateral trade contracts between importing and exporting countries. The prices paid for meat under these contracts varied widely from country to country.

World meat production.—Changes in meat production in any country are closely associated with fluctuations in livestock numbers. There is, of course, a wide variation from country to country in the amount of meat produced from a given number of animals in as much as the uses made of livestock vary and there are also important differences in the efficiency with which livestock are raised.

World meat production in the pre-war years averaged approximately 34 million tons. Of this amount, Europe (excluding the U.S.S.R.) and North America produced more than 60 per cent., with Europe contributing about 36 per cent. of the total and North America 27 per cent. The five principal producing countries of South America (Argentina, Brazil, Uruguay, Chile and Peru) produced about 14 per cent. of the total, Oceania about 4 per cent. and the U.S.S.R. about 9 per cent. The rest of the world combined produced only about 10 per cent. of the total. Beef and veal are the most important kinds of meat, constituting about one-half of the total in the pre-war period. Pork (excluding lard) constituted about 40 per cent. of the total before the war and lamb and mutton about 10 per cent.

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*Condensed from F.A.O. Commodity Reports—Meat & Livestock—May 1949 and December 1950.

During the war, as numbers of livestock were reduced in Europe, meat production declined rapidly, with pork output falling more rapidly and sharply than the production of other types of meat. By 1947, there had been a substantial recovery in pork production and a further increase occurred in 1948. The recovery of beef production has been slower because the decline was not so great and because a longer period of time is required to breed cattle as compared to pigs.

Outside Europe, total production of meat increased during the war. By 1944, North America, which had produced only about two-thirds as much meat as Europe prior to the war, was producing nearly one and one-half times the European volume, and nearly 40 per cent. of the world's meat supply. In South America and Oceania the increase over the pre-war average were small, partly because of drought and partly because demand for meat did not increase as spectacularly as in North America.

The 1950 output of meat in the major producing areas for which information is available amounted to about 10 per cent. above the pre-war average and substantially in excess of 1948 and 1949 production (Table I). Animal feed supplies have been generally good in most areas except Argentina and the Balkans, where drought conditions have been severe; but even in these drought regions, 1950 production of meat equalled or exceeded the 1949 volume because of the somewhat heavier slaughter which the food shortage had necessitated.

TABLE No. I

Production of meat, major producing areas pre-war 1949 *and* 1950

Area	Pre-war	1949	1950 (est.)	1950 as percentage of pre-war
	(Million metric tons)			Per cent
Europe (excl. U. S. S. R.)	12·6	9·8	11·2	89
Western Europe (*b*)	8·8	7·2	8·2	93
Eastern Europe (*c*)	3·8	2·6	3·0	80
North America	9·1	12·2	12·5	138
United States	7·8	10·5	10·8	137
Canada	0·7	0·9	0·9	141
South America (*d*)	5·1	5·6	5·8	114
Oceania and Union of South Africa (*e*) ..	1·9	2·2	2·3	122
Total, above areas (*f*) ..	28·7	29·8	31·6	110

(*a*) Meat is in terms of carcass-weight equivalents and includes beef, veal, lamb, mutton and pork. Excludes lard, but includes edible offal. (Figures for Germany, as included in European totals, include fat cuts of pork.)

(*b*) Austria, Belgium, Denmark, Finland, France, the Federal Republic of Germany, Saar, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

(*c*) Bulgaria, Czechoslovakia, the Soviet Zone of Germany, Greece, Hungary, Poland, Romania and Yugoslavia. Figures for 1949 and 1950 are based largely on estimated information for individual countries in this group.

(*d*) Argentina, Brazil, Chile, Colombia, Peru and Uruguay.

(*e*) Australia, New Zealand, and the Union of South Africa.

(*f*) The U. S. S. R., not included in this table, produced about 3·3 million tons in 938.

Europe.—Europe has long been one of the leading meat producing areas of the world, even though, as a whole, it has not been self-sufficient with respect to meat and has imported large quantities from other countries. In the pre-war period its production consisted of about 52 per cent pork, 42 per cent beef and veal, and 6 per cent lamb and mutton. Its large production of pork was closely associated with milk production in Western Europe, and to some extent with potato production in Central Europe.

Beef and veal production was highly important even though the bulk of the cattle were dairy stock. The Europeans have combined the dairy and meat production enterprise with a high degree of efficiency. By producing calves for veal purposes and slaughtering dairy cows at a somewhat younger age than is the practice in many other areas, they have been able to produce a good quality of both beef and veal from their dairy stock.

Early in the war period, shortage of food resulted in a substantial decline in European pork production. As the war progressed, beef production was also reduced and the quality declined. Data on meat production are almost wholly lacking for the war years. However, as compared with the first three post-war years, 1949 and 1950 have shown marked recovery in European meat production. Western Europe's aggregate output in 1949 was 20 per cent. above that of the previous year, and its 1950 production was roughly 15 per cent above the 1949 volume.

The big increase has been in pork production. For Western Europe as a whole, the increase in 1949 over 1948 averaged 30 per cent., and for Belgium, Denmark, Netherlands, and the United Kingdom, it was in excess of 50 per cent., the 1950 output of pork also shows a substantial improvement over the 1949 volume. The increases in beef and veal output in both 1949 and 1950 have also been large. This is shown in the following figures for Western Europe:—

	Pre-war	1948	1949	1950	1950 percentge of pre-war
	(Million	metric	tons)		Per cent
Pork	4·1	2·4	3·2	3·8	93
Beef and veal	3·6	2·8	3·1	3·4	94
Lamb and mutton	0·6	0·4	0·5	0·5	87

Information on meat production in the Eastern European countries is scanty, but recovery of livestock numbers in some of them seems to have been fairly rapid. It appears that in most of the Eastern European countries the 1949 output of meat was between 65 and 75 per cent. of the pre-war average. Data are almost wholly lacking for 1950, but there has undoubtedly been a substantial gain this year in all these countries.

North America.—The United States and Canada which produce more than 90 per cent. of the North American meat output, accounted for 40 per cent. of the world's total in 1946 as compared with 26 per cent. in 1934-38. Both countries tend to produce slightly more beef and veal than pork, but during the war years these two main classes of meat were about equal in volume.

In North America meat production in 1950 was slightly above the 1949 volume, but nearly 40 per cent. in excess of the pre-war average. Good feed supplies in the United States and Canada have permitted both the maintenance of high livestock numbers and relatively heavy feeding per animal.

As in Europe, the principal increase over pre-war has been in pork production, but beef and veal output has increased significantly also. Lamb and mutton production in the United States and Canada on the other hand, began to decline in the early war years, a trend which has continued into 1950, but there has been some increase in Mexico. The following figures show the relative gains in meat production for North America.

	Pre-war	1948	1949	1950	1950 percentage of pre-war
	(Million metric tons)				Per cent
Pork	3·8	5·3	5·3	5·7	150
Beef and veal	4·3	5·7	5·8	5·8	134
Lamb and mutton	0·4	0·3	0·3	0·3	73

South America.—In South America, Argentina and Brazil produce nearly 85 per cent. of the meat total. Beef and veal constitute about 75 to 80 per cent. of Argentina's production and about 55 per cent. of Brazil's. The pork output of South America is relatively small, but some increases have occurred in recent years. About 85 per cent. of the total is accounted for by Brazil which ranks high among world producers. Both in Argentina and Brazil, conditions are conducive to high pork production. The climate is favourable and maize is relatively abundant.

As a result of increased demand for meat, however, Argentina expanded pork production during the war. In 1938 its production of pork was about 105 thousand metric tons; in 1945 this figure was more than doubled. Brazil, on the other hand, failed to show any sustained increase largely because of drought conditions during part of the war and outbreaks of contagious diseases among the hogs during that period.

Data for South American countries are scanty. It appears, however, that meat production in 1950 for the major producing countries was about 10-15 per cent. above pre-war, and 3 per cent.

above 1949. Official figures for Argentina's production (other than from slaughter) show 1949 at 21 per cent. in excess of pre-war. Uruguay shows an increase of about 12 per cent. for the same period. Increases were substantial for most of the other South American countries except for Brazil, where 1949 production is thought to be below pre-war.

During the latter part of 1949 and early 1950. Argentina suffered a severe drought which had a material effect on livestock production. Heavy slaughtering resulted, but many of these cattle were not in finished condition, however, and meat output in 1950 was not much in excess of 1949. Production has undoubtedly been also affected by the cessation of meat trade with the United Kingdom.

Oceania, South Africa and other areas.—The two principal countries of Oceania—Australia and New Zealand—produced about 5 per cent. of the world's total meat supply in the 1934-38 period, and their production of lamb and mutton accounted for about 27 per cent. of the world's total for this class of meat. Neither country is important in pork production.

Beef production in Australia and New Zealand remained fairly constant during the war period, but Australian mutton production increased during this period by about one-third. In 1946 total meat production was about 6 per cent. above the pre-war average in New Zealand and about 6 per cent. below pre-war in Australia. In 1950 it was up only slightly over 1949 and exceeded the pre-war volume by about 15 per cent.

In South Africa, total meat production had increased substantially by the end of war, and the 1949 production was reported to be about 50 per cent. in excess of pre-war, although there is some question that the data in the two periods are comparable.

For other parts of the world, data on the current situation are more or less fragmentary. In India and China. consumption of animal products is low, and production changes which normally occur from year to year are very small in terms of average supply per person. Data for U.S.S.R. are not available but reports indicate that the decline there was probably of the same order as in some of the Eastern European countries.

The production of meat in selected countries of the world can be seen in Appendix I, and the diagram facing this page.

International trade in meat

Though only 10 to 12 per cent. of the World's meat production enters international trade, yet the monetary value of this trade is greater than its volume might indicate because meat is a relatively high cost food. It is almost wholly confined to a relatively few countries and the bulk of the trade takes place over long distances. Most of the international trade is transacted in terms of soft currency, though a little trade is also conducted in terms of dollars.

The world markets for the three principal classes of meat (beef-veal, pork and lamb-mutton), are independent of each other to some extent, although this tendency has been less pronounced in recent

Sheep arriving for slaughter at Westfield
Freezing Works—New Zealand.

Frozen export lamb—New Zealand—Canvas sling prior to being hoisted on board.

years. In the period 1935-39, total meat supplies entering the international markets (exclusive of live animals) comprised roughly 40 per cent. beef and veal, 44 per cent. pork (including lard) and 16 per cent. lamb and mutton.

Beef exports usually move in world trade as carcases or as canned meat. In the years immediately preceding World War II, chilled and frozen beef together made up more than 80 per cent. of twice that of frozen beef. The chilling process is largely confined twice that the frozen beef. The chilling process is largely confined to high-quality beef from Argentina; exports from Australia and New Zealand are mainly in frozen form. Only about 15 to 20 per cent. of the pre-war pork exports were chilled or frozen, the bulk moving as cured or smoked ham and bacon. Mutton and lamb exports consisted almost entirely of frozen carcases.

Pre-war trade in meat between nations consisted largely of imports by the United Kingdom from Argentina, Australia, Brazil, New Zealand, Canada and Denmark. Germany and France also imported large quantities, but compared with the United Kingdom their significance in the world meat market was slight.

Early in the war period some major shifts in the pattern of world meat trade took place. Although the United Kingdom continued to be the predominant importer, its source of supply changed. Its European supplies were lost to Germany and supplies from Australia and New Zealand were reduced because of shipping difficulties and diversion of exports from these two countries to military forces in the Pacific. As the war progressed, the United States again entered the market as a major supplier and at the same time shipments of meat from Canada and Argentina increased greatly. Argentina, which had averaged about 662,000 metric tons in 1934-38, shipped slightly more than one million tons of meat in 1944. The United States, a net importer of meat in the pre-war period, reached a maximum level of net exports in 1943 with a volume of 1.04 million tons. During the same period, Canada increased its meat shipments to 623 per cent. of the pre-war level. Exports of meat from Australia and New Zealand also showed some increase.

Following the end of the war in 1945, there were again significant shifts in exports trade. Denmark resumed its trade with the United Kingdom, but on a very reduced scale as compared with pre-war. In 1947, as a result of rising prices at home, the United States Government restricted meat exports for the year were only about 10 per cent. of the high level reached in 1943. Canada's exports remained high in 1946, but were much lower in 1947.

Meat exporting countries.—Exports of meat in 1949 were at about the same volume as in 1948. Shipments from the principal European exporters were higher, a reflection of increased production; Denmark and the Netherlands, for example, increased their aggregate production by 165 thousand tons, and their exports by about 100 thousand tons from 1948 to 1949. On the other hand, Canada and Brazil showed sharp reduction in shipments during the same period.

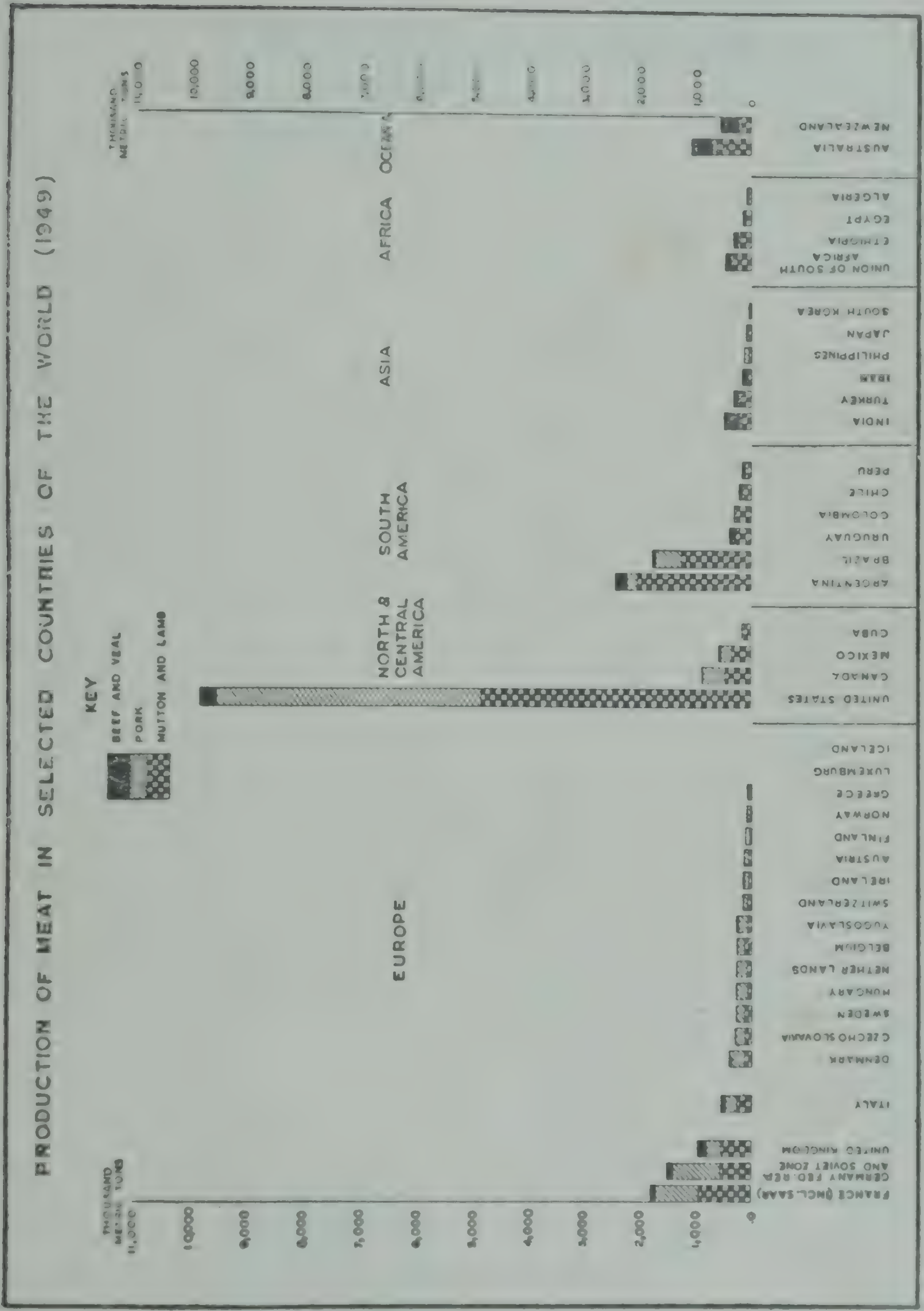
The United States which was a large meat exporter during the war (the world's largest exporter in 1943), has been a net importer during the past three years.

In 1950 there have been big gains in exports of meat from European countries. Denmark's and Poland's exports in the first nine months of 1950 were practically double than those in the same period of 1949. The Netherlands has estimated its trade for all of 1950 at about twice that for 1949.

Argentina, normally the world's largest meat exporter, shipped a much larger volume of meat in the first seven months of 1950 than in the corresponding months of 1949. The bulk of its exportable supply has traditionally gone to the United Kingdom. However, because of failure to arrive at a satisfactory price agreement for the 1950/51 season, its meat exports to the United Kingdom were stopped in July 1950. As on December 1950, the embargo was still in effect, and Argentina's meat exports in the latter months of 1950 had dropped sharply. In August and September, 90 thousand beef quarters were shipped, compared with 925 thousand in the same months of 1949, and only 27 thousand carcases of lamb and mutton compared with 625 thousand in 1949. A large proportion of Argentina's meat production is also now going into canned meat, and its exports of this product to the United States have increased materially (17 thousand tons in the first nine months of 1949 and 40 thousand tons in the first nine months of 1950).

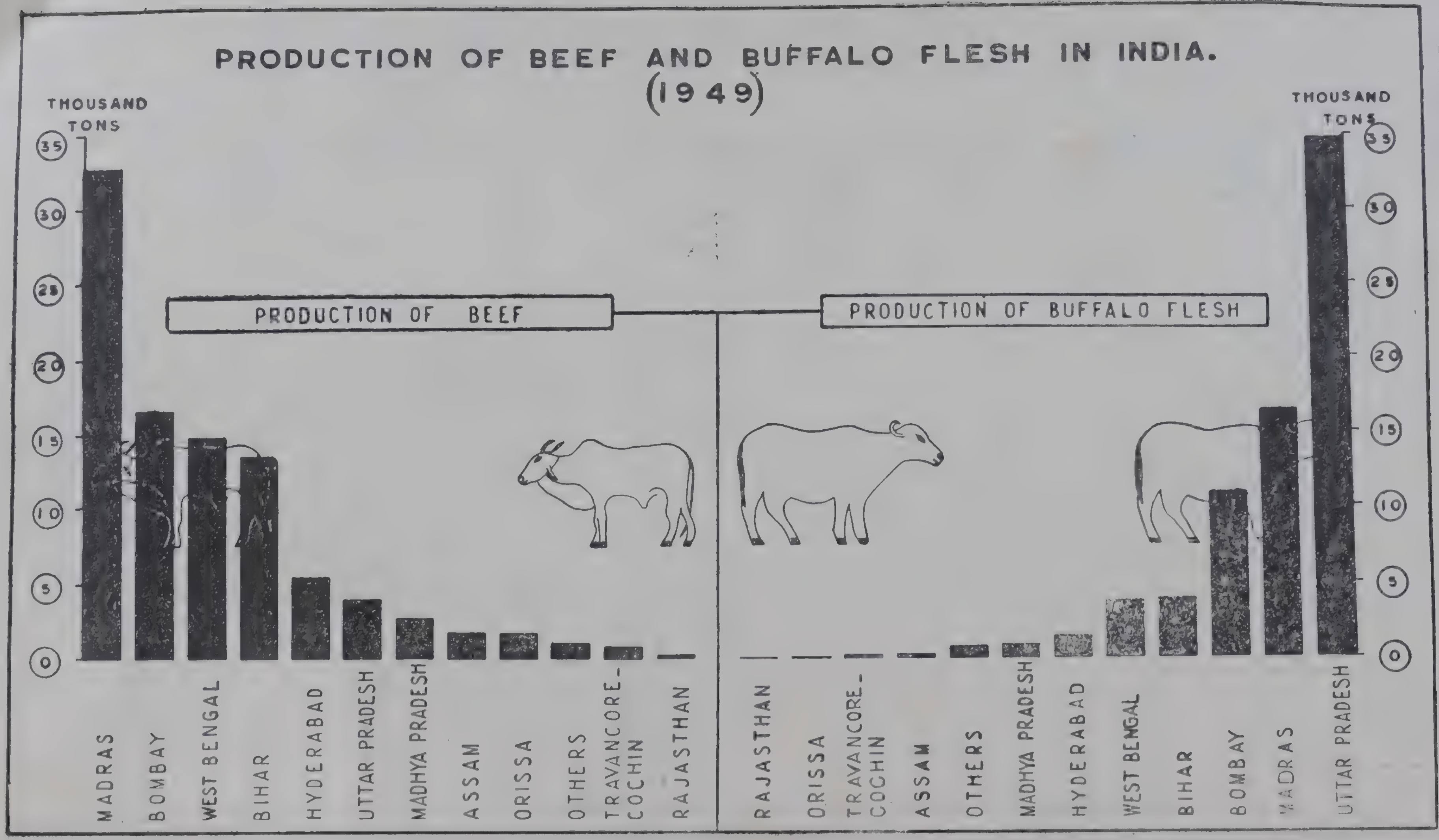
Canada's exports of meat in the first nine months of 1950 were somewhat higher than during the same period of 1949, but far lower than the average volume shipped during the period 1942-48. Its 1950 bacon contract with the United Kingdom was met, but the volume called for was only 60 million pounds (27 thousand tons) as compared with 190 and 160 million pounds in 1948 and 1949 respectively. Canada's rising price level and the United Kingdom's shortage of dollar exchange have made it difficult for these two countries to carry on the high volume of meat trade of a few years earlier. In 1948, Canada stopped all shipments of beef to the United Kingdom and removed its embargo on shipments of beef, veal, lamb and mutton to the United States. As a result, its shipments to the United States have been heavy. During the first eleven months of 1950, its exports of dressed beef, veal, lamb and mutton to the United States totalled about 70 million pounds, which was about the volume shipped during the same period of 1949.

Meat importing countries.—Despite the cessation of its meat trade with Argentina and Uruguay, the United Kingdom's imports in 1950 slightly exceeded the 1949 volume. This was the result of extremely large imports of beef from Argentina in the first seven months of the year and much larger imports of bacon and ham from continental Europe. Argentina's shipments of all meat products to the United Kingdom from January to July 1950 were 60 to 65 per cent. over those for the same period of 1949, and the United Kingdom's imports of bacon from Denmark, Poland and the Netherlands in the first nine months of 1950 were two and a half times the volume in the same months of 1949.



PRODUCTION OF MEAT IN SELECTED COUNTRIES OF THE WORLD (1949)

Facing page 11]



Belgium, which was the second largest European importer in 1948, reduced its imports sharply in 1949 and 1950. This reduction has been offset by the increasing domestic production of meat.

The meat imports of the United States are made up primarily of beef and veal from Canada and canned meat from Argentina and Uruguay. Its imports of canned meat seem likely to continue at a high rate as the demand for meat increases.

International Trade in meat for 1949 is shown in Appendix II.

Bilateral contracts.—Pre-war international trade in meat was chiefly in the hands of private operators. Early in the war period, trade in meat, as in most other goods, passed into the hands of Governments in most importing and exporting countries, and negotiations with respect to quantities, prices, and other terms were carried on by Government representatives of the countries involved.

Outside Axis controlled territory, the international movement of meat during the war was subject largely to the allocations agreed between the Governments represented on the combined Food Board and its Eastern Hemisphere counterpart, the London Food Council, which were set up in 1942 to co-ordinate Allied employment of available food resources; the United Kingdom was responsible, on behalf of the Allies, for the actual conduct of meat purchases in Commonwealth countries and in South America; Lease-lend supplies constituted a large proportion of the total available to the Allied Nations after the entry of the United States into the war. In 1946 the Combined Food Board and London Food Council were wound up, and much of their programming functions passed to the International Emergency Food Council (a committee of F.A.O.) but early in 1948, meat was taken off the "Reserved Commodity List" and was no longer subject to international allocations.

The principal international trade contracts involving meat are those which the United Kingdom has with the major meat exporting countries. These are long term contracts with provision for renewals or extensions in due course, and the bulk purchasing arrangements cover a high proportion of world trade in meat and essentially all of the United Kingdom's meat imports. The newly concluded Anglo-Argentine trade pact announced recently (April 23, 1951) says that Britain during the next 12 months will receive 200,000 tons of chilled and frozen meat and 30,000 tons of tinned meat at prices ranging between £118 and £145 a ton. Price in 1949-50 was £97-10-0 per ton.

A meat agreement* between Britain and Australia covering 15 years (from July, 1952) has recently been arrived at. The agreement specifies that both countries are to endeavour to develop meat production in Australia and increase meat export. Australia undertakes to use her best endeavours to maintain the present volume of exports and to bring about steadily increasing volume. In return Britain will provide a satisfactory market in the United Kingdom for the whole of Australia's exportable surplus during the currency of the agreement.

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* Food Manufacture—July 1952, page 263.

The prices paid for meat under these contracts varied widely from country to country, as can be seen from the table below:—

TABLE NO. II

Approximate meat prices paid under various United Kingdom contracts effective in mid. 1948 (a).

Exporting Country	Carcass beef		Carcass lamb		Bacon (Wiltshire sides)	
	Pence per lb.	Dollars per 100 kg.	Pence per lb.	Dollars per 100 kg.	Pence per lb.	Dollars per 100 kg.
Denmark	15·5 (*b*)	57·08	(*c*)	(*c*)	24·1	88·74
Ireland	..	..	..	..	24·1	88·74
Canada	15·8	58·18	(*c*)	(*c*)	21·4	78·79
Australia	5·3	19·51	7·8	28·71	10·9	40·12
New Zealand ..	5·0	18·40	8·8	32·40	10·1	37·19
Argentina	9·5 (*d*)	35·00	14·0 (*d*)	51·54	(*c*)	(*c*)
Uruguay	7·9 (*e*)	29·08	..	..	(*c*)	(*c*)

B—Production and value of beef, buffalo flesh, mutton, goat flesh and pork

General

Rearing and breeding of cattle, sheep and goat, is the most ancient of agricultural pursuit in this country and judged by the population, India is one of the most important livestock countries of the world. It has roughly one-fourth of world's total bovine (oxen and buffaloes) population which is the largest number of any country in the world. The number of sheep, goats and other domesticated animals is also fairly large in India. Despite all this huge livestock population, the rearing of cattle, sheep and goats is an industry subservient to agriculture, except in a few farmable localities where

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(*a*) All prices are f.o.b. the exporting country, converted to pence (sterling) per lb. and U. S. dollars per 100 kilos, and pertain to good first quality carcass beef, first quality lamb, and first grade Wiltshire sides.

(*b*) Not under contract to the United Kingdom, but prices at which Denmark exported during 1948.

(*c*) Not under contract.

(*d*) Exact contract price is not known. The price for beef is probably somewhere between 9 and 10 pence. The prices in the table, which are based on unconfirmed reports, include an allowance for the lump-sum payment of 10 million pounds, sterling, by the British at the beginning of the contract period. Other sources, however, indicate that the price for beef, including the lump-sum payment, may be as low as 12 to 12·5 cents or 7·5 pence per pound. *The Review of the River Plate*, an Argentine trade journal, indicated in its 25th February, 1949 issue that the average price for bone-in-beef (including an allocation from the lump-sum payment) was 944 pesos per kg., which at official exchange rates would mean a price of 12·7 cents or 7·6 pence per lb.

(*e*) Quoted contract price adjusted to include lump-sum payment by the British.

there are special facilities of good pasture land enabling livestock breeding to be developed as an independent industry. Throughout the country agriculture and animal husbandry are complementary to each other. Most of the agricultural and allied operations are carried on in the country under a variety of adverse climatic and other environmental conditions with the result that an average cattle, sheep or goat breeder is poor and resourceless. He lives on small fragmented holdings, the large majority of which are less than 5 acres. The average size of his herd or flock consists of only a few inefficient animals, and little economic use is made of them with the result that both meat and milk yields are amongst the lowest in the world. The low rate of production is not due to any inherent incapacity to produce, for Indian livestock have been shown to possess potentialities. Even in the present undeveloped state the total contribution of Indian cattle alone to Indian economy was estimated in pre-war times to be of the order of 1,000 crores of rupees.

In all civilised countries, the animals which furnish food for human consumption are drawn almost entirely from those which consume plant food, as hay, straw, roots or grain. The flesh of carnivorous animals, including the cat and dog, is repugnant to many and on this account the consumption of cat and dog flesh has now practically ceased in all civilised countries.

Cattle, buffaloes, sheep, goats and pigs, constitute the primary source of market meat in India. Among the various livestock products, *viz.*, milk, eggs, butter, ghee etc. meat comes next in importance to milk from the point of view of its demand for human consumption. Meat forms an important item of food, amongst all communities excepting the orthodox and staunch vegetarians. Broadly speaking, Muslims produce and consume more meat than other communities.

On account of religious and other reasons, the killing of cattle for food, takes place on a comparatively small scale, both in urban and rural areas, in India. Most of the religious sentiment attaching to the cow among Hindus has its origin to the crucial place it occupies in the agricultural economy of the country. Apart from supplying milk and milk products to a people, whose staple food consists of cereals, it also supplies draught animals for agricultural operations. Generally old, decrepit and unserviceable animals are slaughtered, excepting in few big cities like Bombay, Calcutta, Madras etc. where young cows and buffaloes are also slaughtered at the end of their lactation as these cannot be economically maintained during the dry periods.

Sheep are found all over the country, usually mingled with goats. An average flock, more often than not, consists of all sorts of animals suitable for the production of mutton, wool and milk. The wide variety of soil and climate conditions, however, have resulted in the development and maintenance of a large number of sheep breeds all possessing their special characteristics. Mutton, produced in India, on this account, shows some variations since its character is generally determined by the breed, type and also the locality where the animal is bred. The area of concentration for sheep are the States of Rajasthan, Mysore, Madras, Uttar Pradesh and Hyderabad.

The goat has been associated with man for ages. It is kept mostly by village folks and it is a common sight to see goats grazing in flocks by road sides and in the fields. The *ryots* and nomadic classes keep goats mainly for their mutton, milk and manure. Being a prolific breeder and cheaply reared its value as a meat producing animal is superior to many others. Goats are mainly concentrated in the Uttar Pradesh, Bihar, West Bengal, Rajasthan and Madras.

Pigs are found in certain parts but they being unclean and dirty are not eaten by many particularly Muslims whose religion enjoins on them not to eat pork. The chief characteristic of the pig is that it matures within a shorter time than any other domestic animal, *i.e.*, in about 9 months. It is very prolific and will produce about six-ten piglings in each litter, and frequently two litters in a year. The importance of building up a progressive pig industry in India, however, has not been realised with the result that pig farming is yet in stage of its infancy in this country.

A few camels and rabbits are occasionally killed here and there but the quantity of their meat from marketing point of view is absolutely negligible.

Meat may be defined as the edible flesh of mammals used for food. In a broad sense, it may also include the flesh of fish, poultry and game. The kinds of meat, however, considered in this Report are beef, buffalo flesh, mutton, goat flesh and pork only.

Production of meat in India

Commercially meat is the properly dressed flesh excluding by-products both edible and inedible derived from cattle, buffaloes, sheep, goats and pigs. The meat obtained from cattle is called 'beef', while that obtained from sheep and pigs is termed as 'mutton' and 'pork'. All meat contain some fat, either as an exterior covering, intermingled with muscle fibres; or as an inter-cellular deposit.

The production of meat is closely related to the total livestock population, number of animals slaughtered and the quantity of dressed meat obtained from different animals. There is, of course, a wide variation from State to State in the amount of meat produced from a given number of animals, in-as-much as the uses made of livestock vary and there are also important differences in the efficiency with which the livestocks are raised.

Broadly speaking, the health of the cattle and other livestock in India, is generally poor and mortality rate fairly high. Veterinary facilities are very limited. The animals are housed in insanitary conditions. The livestock is reared on uneconomic and unsound lines. The majority of animals get no succulent fodder at all, except during the monsoon months and even water is not available, *ad lib*, as the supply is insufficient and irregular. The cattle are puny, undersized, and half-starved, and are the victims of multifarious chronic epidemics. Not only is the quality of cattle deplorably low, it is continuously on the down grade. No wonder the average dressed carcase yield per animal is very low in India, as compared to many progressive countries of the world.

(a) *Livestock population.*—According to 1945 Livestock Census, which was more comprehensive than that of 1940, in-as-much as that almost all the then provinces and States participated in it, the pre-partitioned India possessed about 206 million cattle and buffaloes which formed nearly a third of the world's total bovine population. The exact figures for the Indian Union are not yet available, but roughly India's share of the bovine population is little more than three-fourth of 206 million which means about a quarter of the world's total. In addition to cattle, undivided India had about 56 million goats, 44 million sheep, 3.8 million pigs and 1 million camels. And again the rough proportions which fell to India's share was roughly little more than three-fourth of the total in each case. The results of the Census are summarised in the table below :—

Table No. III

Number of cattle, buffaloes, sheep, goats, pigs and camels in India
(In lakhs)

	Pre-partitioned India (1945)	India (estimated)*
Cattle	1598·81	1396·52
Buffaloes	462·00	415·18
Sheep	436·59	390·61
Goats	558·67	476·68
Pigs	38·05	37·13
Camels	10·83	6·56
Total ..	3104·95	2722·68

(b) *Number of animals slaughtered.*—The estimation of the number of animals slaughtered in and outside the slaughter houses has been rather difficult, as reliable data is not readily available. Some of the Municipalities and Local Boards do not record the number of animals slaughtered for meat. In others, oxen and buffaloes, as also sheep and goats are not separately recorded. A large number of animals is also slaughtered privately and their number is not easily ascertained. However, every effort has been made to collect as much data as possible from a variety of sources and all factors have been taken into account for arriving at proper estimation. The proportion of animals slaughtered in recognised slaughter houses is based on the slaughter house returns furnished by various Municipalities and Local Boards, while the number of animals slaughtered outside the slaughter houses has either been computed on the basis of livestock population and available information or by carrying out actual surveys in selected representative areas.

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*Including estimates for non-reporting areas.

(c) *Meat yield.*—The amount of dressed meat or yield obtained per animal depends to a large extent upon the live weight and the size and breed of the animal. Topography and climatic conditions of particular tracts have also some bearing on the yield of meat per animal. Different classes of animals yield different quantities of meat and within their own range their yields vary from animal to animal. All sorts of animals in different weight groups such as heavy, medium and light are slaughtered.

The live weight of an ox varies anything from 500 to 800 lb. A cow in prime condition weighs 450 to 600 lb. A heifer 100 to 250 lb. A calf 50 to 100 lb. A buffalo may weigh 500 to 1,000 lb. or even more. Similarly, the weight of a full grown sheep or goat varies from 30 to 60 lb. and that of a small lamb or kid from 5 to 12 lb. Likewise a pig may weigh anything from 70 to 200 lb.

It may be noted that so far beef cattle is concerned, excepting few important cities where dry, young cows and buffaloes are killed, generally old, debilited, infirm and unserviceable animals are slaughtered and, therefore, the average live weight shown above may not hold true in their case. Certain breeds of animals as in Bihar, Orissa, Assam and Madhya Pradesh are also rather puny and small in stature as compared to those found in other areas. Owing to various restrictions imposed on the slaughter of calves, young milch cows and working cattle in recent years, there is an increased tendency for more buffaloes to be slaughtered. Male buffalo calves are invariably slaughtered as they are considered uneconomical to rear.

In case of pigs, largely because of the proportionately smaller chest cavity in the carcase, as also because the skin is left on the carcase, the dressing percentage or yield of meat is considerably higher in pigs than in any class of meat animals, and percentages do not vary with grade quite so much as is true in carcases of other kinds of meat. The head is considered a part of the carcase and this increases the yield proportionately.

As the factors mentioned above, widely vary from region to region and even between two neighbouring districts, a satisfactory method of estimating the meat yields, for different kinds of animals, in different parts of the country would be to examine the meat yield records of a large number of slaughtered animals, both in urban and rural slaughter houses over a long period. Unfortunately, such records are not readily available. Wherever such records of individual animals are available, they are not comparable, usually being the best specimens intended for city consumption and quite different from the animals slaughtered in villages and rural areas. For these reasons, the available records can not be taken to represent the general run of the animals in the country and it would be incorrect to generalise upon the yields obtained or to regard them as applicable to India as a whole. Due to variations in climatic and topographical conditions, the production of meat varies widely in different parts of India. For computing the production of meat of various types, all the variable factors mentioned above have been taken into consideration and the meat yields in different areas have been adjusted on the basis of average dressed carcase weight obtained from different animals in the country, after making extensive enquiries from butchers, livestock owners and merchants of long standing. In many instances the yields had been verified by actual determinations from different animals selected at random.

Production of beef and buffalo flesh

The details regarding number of different kinds of animals slaughtered, the quantity of meat yielded by each species and the estimated annual production of meat in different States in India are given in Appendices III and IV (*see* diagram facing page 11) and are summarised in the table below.

TABLE NO. IV

Production of beef & buffalo flesh (1949)

State	Beef				Buffalo flesh			
	No. of oxen slaughtered (lakh)	Average yield per ox (lb.)	Production of beef (ton)	Percentage to total	No. of buffaloes slaughtered (lakh)	Average yield per buffalo (lb.)	Production of buffalo flesh (ton)	Percentage to total
Assam ..	0·29	140·0	1830·1	1·9	0·03	285·0	381·7	0·5
Bihar ..	2·35	130·0	13659·6	14·2	0·50	175·0	3935·9	5·3
Bombay ..	1·65	225·0	16573·7	17·3	0·55	450·0	10986·8	14·9
Delhi ..	..	..	..	..	..	..	..	..
Himachal Pradesh	..	..	..	..	..	..	..	..
Hyderabad ..	0·88	140·0	5490·8	5·7	0·12	275·0	1459·1	2·0
Kashmir ..	..	..	..	..	..	..	..	..
Madhya Bharat	..	..	..	..	..	..	..	..
Madhya Pradesh	0·44	140·0	2751·6	2·9	0·07	275·0	902·4	1·2
Madras ..	4·07	180·0	32705·4	34·1	1·23	300·0	16473·2	22·3
✓Mysore ..	..	..	..	..	..	..	..	..
Orissa ..	0·33	120·0	1755·9	1·8	0·01	175·0	87·9	0·1
P. E. P. S. U. ..	..	..	..	..	..	..	..	..
Punjab ..	..	..	..	..	..	..	..	..
Rajasthan ..	0·05	140·0	342·2	0·4	(*a*)	384·0	62·6	0·1
Saurashtra ..	..	..	..	..	..	..	..	..
Travancore-Cochin	0·13	150·0	837·4	0·9	0·03	200·0	275·7	0·4
Uttar Pradesh ..	0·57	160·0	4041·8	4·2	2·78	280·0	34755·3	46·9
Vindhya Pradesh	..	..	..	..	..	..	..	..
West Bengal ..	1·80	184·5	14832·9	15·5	0·24	365·0	3823·1	5·2
Others (*b*) ..	0·13	174·3	1025·6	1·1	0·08	244·5	833·0	1·1
Total ..	12·69	169·2	95847·0	100·0	5·64	293·8	73976·7	100·0

(*a*) Below 500.

(*b*) Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura.

As will be observed from the figures in table No. IV and the diagram facing this page, the total Indian production of beef and buffalo flesh amounts to about 169,824 tons, of which 95,847 tons or 56.5 per cent. are derived from cattle and 73,977 tons or 43.5 per cent. from buffaloes. Buffaloes represent only little less than one-third of the total number of cattle in the country, and consequently the production of buffalo flesh is small as compared to beef.

The estimated meat yield per beef cattle in different areas varies from 120 lb. in Orissa to about 225 lb. in Bombay, with an average of 169.2 lb. for the whole of India.

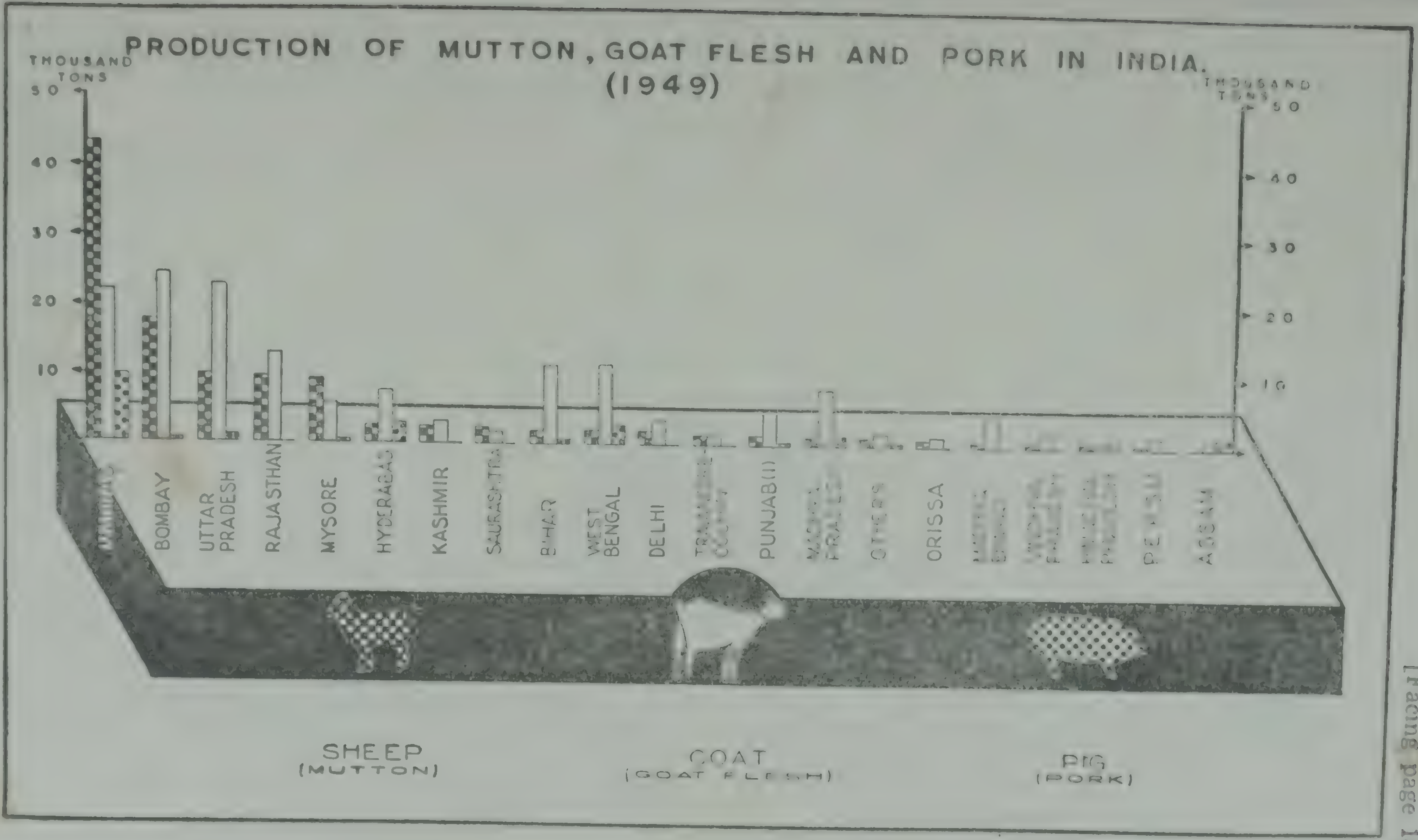
Of all the areas, Madras State produces the largest volume of beef and contribute 34.1 per cent. of the total production of beef in India. Bombay State stands second with 17.3 per cent. to its credit. West Bengal with 15.5 per cent. and Bihar with 14.2 per cent. are the other important beef producing areas.

In case of buffalo flesh, the meat yield in different areas, as a comparison with those for beef cattle show, that in all areas the buffalo yields are higher. Buffaloes do not thrive well in the hilly tracts or where nutritive fodder is not available. This accounts for low meat yield in some places like Orissa, where the average meat yield is only 175 lb. Bombay State has the largest meat yield, *viz.*, 450 lb. while the average yield per buffalo for whole India is 293.8 lb. or more than one and a half times that of beef cattle.

The production of buffalo flesh is concentrated in the Indo-Gangetic plain excluding West Bengal. It will be seen that Uttar Pradesh produce 46.9 per cent. of the total buffalo flesh in India, followed by Madras and Bombay with 22.3 per cent. and 14.9 per cent. respectively. West Bengal which produces 15.5 per cent. of India's total beef supplies, contributes only 5.2 per cent. to the total production of buffalo flesh.

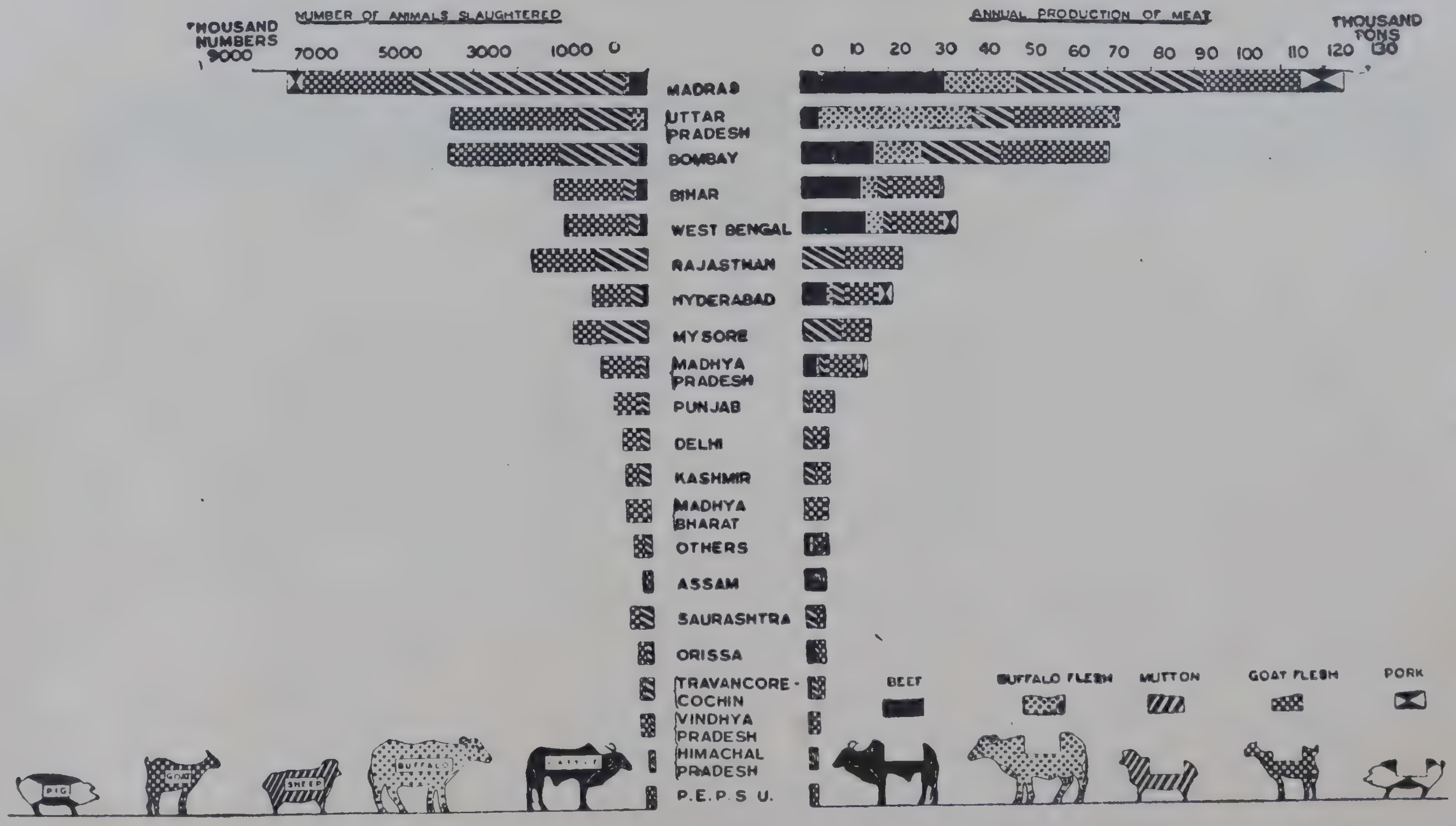
Production of mutton and goat flesh

Though sheep and goats are found all over the country in large numbers, the production of mutton and goat flesh varies widely in different parts of India. Where land is undeveloped and climate is suitable, *e.g.*, Rajasthan sheep and goats are kept in large flocks for production of meat and wool.



PRODUCTION OF MUTTON, GOAT FLESH AND PORK IN INDIA.
(1949)

NUMBER OF DIFFERENT KINDS OF ANIMALS SLAUGHTERED AND ANNUAL PRODUCTION OF MEAT IN DIFFERENT STATES IN INDIA. (1949)



The production of mutton and goat flesh in various parts of India is given in Appendices V & VI (*see* diagram facing page 18) and is summarised in the table below. The basis for computation is the same as described under the beef and buffalo flesh production:

TABLE No. V

Production of mutton and goat flesh in India (1949)

State	Mutton				Goat flesh			
	No. of sheep slaughtered (lakh)	Average yield per sheep (lb.)	Production of mutton (tons)	Percentage to total	No. of goats slaughtered (lakh)	Average yield per goat (lb.)	Production of goat flesh (tons)	Percentage to total
Assam ..	0·02	18·0	15·2	Neg	1·19	16·0	848·6	0·5
Bihar ..	2·69	17·5	2099·6	1·9	15·34	17·0	11638·8	7·4
Bombay ..	18·19	22·0	17865·6	15·9	24·91	22·0	24465·8	15·7
Delhi ..	2·02	22·0	1979·2	1·8	3·96	20·5	3624·8	2·3
Himachal Pradesh	0·59	22·0	576·5	0·5	0·55	22·0	543·1	0·3
Hyderabad ..	2·88	21·0	2699·8	2·4	7·59	23·0	7793·8	5·0
Kashmir ..	2·61	22·0	2563·5	2·3	2·87	25·0	3201·9	2·1
Madhya Bharat	0·85	20·0	757·4	0·7	4·69	22·0	4609·2	3·0
Madhya Pradesh	1·31	20·0	1166·7	1·0	8·40	22·0	8251·4	5·3
Madras ..	48·45	20·0	43258·9	38·6	24·75	20·0	22098·2	14·2
Mysore ..	10·73	19·5	9345·2	8·4	6·27	21·0	5873·4	3·8
Orissa ..	1·11	16·5	818·2	0·7	1·84	16·5	1358·6	0·9
P. E. P. S. U. ..	0·54	21·0	504·1	0·5	1·58	21·0	1476·9	1·0
Punjab ..	1·56	20·0	1397·3	1·2	6·35	18·0	5102·9	3·3
Rajasthan ..	11·84	18·0	9512·7	8·5	14·57	20·0	13012·4	8·4
Saurashtra ..	3·01	18·0	2421·7	2·2	2·08	20·0	1856·3	1·2
Travancore-Cochin	1·57	20·0	1406·3	1·2	1·31	22·0	1290·6	0·8
Uttar Pradesh	12·50	18·0	10047·4	8·9	28·64	18·0	23015·5	14·8
Vindhya Pradesh	0·74	18·0	592·4	0·5	2·25	20·0	2011·2	1·3
West Bengal ..	2·26	20·0	2017·3	1·8	14·14	18·5	11672·2	7·5
Others (*a*) ..	1·35	18·3	1105·0	1·0	2·17	19·6	1892·7	1·2
Total ..	126·82	19·8	112150·0	100·0	175·45	19·9	155638·3	100·0

(*a*) Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura.

It will be observed from the Table No. V that the total Indian production of mutton and goat flesh amounts to 267,788 tons, of which 112,150 tons or 41.9 per cent. are obtained from sheep and 155,638 tons or 58.1 per cent. from goats.

The meat yields in case of sheep, vary from 16.5 lb. in Orissa to 22 lb. in Bombay, Delhi, Kashmir and Himachal Pradesh with an average of 19.8 lb. for the whole of India.

As in the case of beef production, Madras State produces the biggest quantity of mutton in India, *viz.*, 43,258.9 tons or 38.6 per cent. of the total. This State possesses a large concentration of sheep as compared to other States. It is followed by Bombay and Uttar Pradesh accounting for 15.9 and 8.9 per cent. respectively. Rajasthan with 8.5 per cent. and Mysore with 8.4 per cent. are the other important mutton producing areas.

In case of goats, it is noticed that goats from Kashmir and Hyderabad States are particularly heavy yielders, yielding 25 lb. and 23 lb. meat respectively. Assam has got the lowest yield 16 lb. with an average of 19.9 lb. for the whole of India.

In the production of goat flesh, Bombay tops the list and produces 15.7 per cent. Uttar Pradesh contributes 14.8 per cent. whereas Madras State, Rajasthan, West Bengal and Bihar produce 14.2, 8.4, 7.5 and 7.4 per cent. respectively.

Production of pig flesh

Pigs are reared mostly in Northern and Southern India. Pigs found in India are mostly of the indigenous type, small in stature and being unclean and dirty are not eaten by many, particularly Muslims whose religion enjoins them not to partake or eat pork. The pig flesh has thus a limited market mostly in big towns. The production of pig flesh in different parts of India is given in Appendix VII (*see* diagram facing page 18) and is summarised in the following table. The basis of computation for this also is the same as described under the beef and buffalo production.

TABLE No. VI

Production of pork in India (1949)

State 1	No. of pigs slaughtered. (lakh) 2	Average yield per pig. (lb.) 3	Production of pig flesh. (tons) 4	Percentage to total. 5
Assam	0·54	60·0	1446·1	6·1
Bihar	0·44	50·0	982·1	4·2
Bombay	0·21	50·0	475·6	2·0
Delhi	0·02	75·0	75·0	0·3

TABLE No. VI—*contd.*

1	2	3	4	
Himachal Pradesh	0·30	80·0	1081·5	4·6
Hyderabad	1·12	60·0	3000·0	12·7
Kashmir	..	..	..	..
Madhya Bharat	..	..	..	..
Madhya Pradesh	0·54	60·0	1434·7	6·1
Madras	3·70	60·0	9910·7	41·9
Mysore	0·11	75·0	359·1	1·5
Orissa	0·02	75·0	54·1	0·2
P. E. P. S. U.	..	..	..	..
Punjab	0·11	100·0	489·4	2·1
Rajasthan	..	..	..	..
Saurashtra	..	..	..	..
Travancore-Cochin	(*a*)	80·0	14·3	0·1
Uttar Pradesh	0·32	80·0	1122·4	4·7
Vindhya Pradesh	..	..	..	..
West Bengal	0·63	100·0	2814·6	11·9
Others (*b*)	0·11	74·5	373·6	1·06
Total	8·17	64·8	23633·2	100·0

It will be seen from the above figures and the diagram facing this page that the total Indian production of pig flesh is about 23,633 tons. The estimated meat yield per pig varies from 50 lb. in Bombay and Bihar to 100 lb. in Ajmer, Punjab (I) and West Bengal with an over all average of 64.8 lb. for the whole of India. Madras State stands first with 41.9 per cent. of the total to her credit. The other outstanding pig flesh producing areas are Hyderabad, West Bengal, Assam and Madhya Pradesh which account for 12.9, 11.9, 6.1 and 6.1 per cent. respectively.

(*a*) Below 500.

(*b*) Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura.

The proportion of different kinds of animals slaughtered to the total cattle, buffaloes, sheep, goat and pig population in India is shown in the table below:

TABLE NO. VII

Percentage of animals slaughtered to the total cattle, buffaloes, sheep, goat and pig population in India

—	Total estimated population (lakh)	No. of animals slaughtered (lakh)	Percentage of slaughtered animals to total population
Cattle	1396·52	12·69	0·9
Buffaloes	415·18	5·64	1·4
Sheep	390·61	126·82	32·5
Goats	476·68	175·45	36·8
Pigs	37·13	8·17	22·0
Total ..	2716·12	328·77	12·1

It will be seen that the number of cattle slaughtered annually amount to roughly 12.69 lakh heads or 0.9 per cent. of the total cattle population in India. Though buffaloes comprise roughly about 30 per cent. of the total number of cattle, yet the percentage of its slaughter is relatively more *viz.*, 1.4 per cent. representing 5.64 lakh heads.

Unlike cattle and buffaloes which are mainly kept in India for milk and draught purposes, the bovine are killed in large numbers for meat production. The number of sheep slaughtered is estimated at 126.82 lakh heads representing 32.5 per cent. of total sheep population. The number of goats slaughtered amount to 175.45 lakh, constituting 36.8 per cent. of total goat population.

Production of pig flesh or pork though steadily on increase, is still rather small in India. Hardly 8.17 lakh pigs are slaughtered annually representing 22.9 per cent. of the total pig population in India.

Taking all the food animals together, it will be seen that only 12.1 per cent. of the total livestock population representing the above species are slaughtered in India. The number of animals slaughtered inside and outside the slaughter house in India is shown in Appendix VIII.

Summary of meat production

The production of meat in India (*see* Appendices II to VI for full particulars) can now be summarised as in the following table :—

Table No. VIII

Summary of meat production

—	Beef	Buffalo flesh	Mutton	Goat flesh	Pig flesh	Total
1. Slaughtered animals (lakhs).	12·69	5·64	126·82	175·45	8·17	328·77
2. Dressed weight or yield per carcase (lb.)	169·2	293·8	19·8	19·9	64·8	. .
3. Annual production of meat (tons).	95,847·0	73,976·7	112,150·0	155,638·3	23,633·2	461,245·2
4. Percentage to total production.	20·8	16·0	24·3	33·8	5·1	(100)

As will be observed from the figures in the above table and the diagram facing this page, the total Indian production of meat amounts to about 461,245.2 tons, of which 155,638.3 tons or 33.8 per cent. are derived from goats and 112,150.0 tons or 24.3 per cent. from sheep. Both the types combined together constitute 58.1 per cent. or more than half of India's total meat supply.

Beef contributes 95,847.0 tons or 20.8 per cent. and buffalo flesh 73,976.7 tons or 16.0 per cent. of total meat produced. These two types of flesh together account for 36.8 per cent. or little more than one-third of the available total meat production in India. The remaining quantity *viz.*, 23,633.2 tons or 5.1 per cent. comprises of pig flesh.

It might be stated that the position with regard to beef has undergone considerable change since the partition of the country in August 1947. Delhi, Punjab, etc., which were once the flourishing centres of beef production have suffered a severe set back since the division of the country and the eventual migration of a large number of beef eating communities to Pakistan. Again, complete prohibition of slaughter of cattle by legislation in Mysore and some other States, voluntary stoppage of cattle slaughter in many places like Delhi, Punjab (I) etc. and restrictions on indiscriminate slaughter of cattle and on certain categories in centres like Bombay, Madhya Pradesh, Uttar Pradesh, etc. have greatly reduced the production of beef in India.

The relative importance of different countries, so far the production of meat in the major producing countries of the world is concerned is shown in Appendix I. It will be seen that the production of meat in the major producing areas of the world in 1949 is estimated to be about 29.8 million metric tons. Taking the countries individually, the United States of America produces one-third of the total meat produced in the world. Argentina comes next with 8.4 per cent.; closely followed by Brazil with 6.1 per cent. India produces only 1.5 per cent. (469 thousand metric tons).

In United States of America, Argentina, Australia, Europe, etc. the breeders have succeeded in raising good quality special meat type animals, but in India, due to primitive methods of rearing, the general conditions of the food animals have remained more or less where it was many years back, with the result a large proportion of the meat particularly the beef, that is produced in the country is of inferior quality and the meat yields are generally fairly low.

Share of different states in the production of meat

The share of different States in the production of meat in India is shown in the table below (*see* diagram facing page 19) :—

TABLE NO. IX

Share of different States in the production of meat (1949)
(in tons)

State 1	Beef 2	Buffalo flesh 3	Mutton 4	Goat flesh 5	Pork 6	Total 7	Percentage to total 8
Ajmer ..	..	79·0	410·4	969·6	2·9	1461·9	0·3
Assam ..	1830·1	381·7	15·2	848·6	1446·1	4521·7	1·0
Bhopal ..	260·7	659·9	440·0	293·3	..	1653·9	0·4
Bihar .	13659·6	3935·9	2099·6	11638·8	982·1	32316·0	7·0
Bilaspur	..	..	4·4	17·9	..	22·3	Neg.
Bombay	16573·7	10986·8	17865·6	24465·8	475·6	70367·5	15·3
Coorg ..	..	..	77·5	56·8	285·7	420·0	0·1
Delhi ..	..	..	1979·2	3624·8	75·0	5679·0	1·2
Himachal Pradesh	..	..	576·5	543·1	1081·5	2201·1	0·5
Hyderabad	5490·8	1459·1	2699·8	7793·8	3000·0	20443·5	4·4
Kashmir	..	..	2563·5	3201·9	..	5765·4	1·3
Kutch ..	..	..	151·4	202·2	..	353·6	0·1
Madhy Bharat	..	..	757·4	4609·2	..	5366·6	1·2

TABLE NO. IX—*contd.*

1	2	3	4	5	6	7	8
Madhya Pradesh	2751·6	902·4	1166·7	8251·4	1434·7	14506·8	3·1
Madras ..	32705·4	16473·2	43258·9	22098·2	9910·7	124446·4	27·0
Manipur	63·0	12·8	..	5·9	85·0	166·7	Neg.
Mysore ..	..	..	9345·2	5873·4	359·1	15577·7	3·4
Orissa ..	1755·9	87·9	818·2	1358·6	54·1	4074·7	0·9
P.E.P.S.U.	..	..	504·1	1476·9	..	1981·0	0·4
Punjab ..	..	..	1397·3	5102·9	489·4	6989·6	1·5
Rajasthan	342·2	62·6	9512·7	13012·4	..	22929·9	5·0
Saurashtra	..	..	2421·7	1856·3	..	4278·0	0·9
Sikkim	701·9	52·0	20·8	314·0	..	1088·7	0·2
Travancore Cochin	837·4	275·7	1406·3	1290·6	14·3	3824·3	0·8
Tripura	..	29·3	0·5	33·0	..	62·8	Neg.
Uttar .. Pradesh	4041·8	34755·3	10047·4	23015·5	1122·4	72982·4	15·8
Vindhya Pradesh	..	..	592·4	2011·2	..	2603·6	0·6
West Bengal	14832·9	3823·1	2017·3	11672·2	2814·6	35160·1	7·6
Total ..	95847·0	73976·7	112150·0	155638·3	23633·2	461245·2	100·0

It will be found that the production of meat varies considerably from tract to tract, depending as it does on a number of local factors, such as livestock population, method of rearing and management, the availability of suitable fodders, climate, the concentration or otherwise of the number of meat eating communities in an area and finally the restrictions imposed on the slaughter of certain categories of food animals.

It will be noticed that cattle are not slaughtered in 14 out of 23 States mentioned in the table. The proportion of slaughtered beef cattle to the total cattle population is 0.9 per cent. only as against the estimated 3 per cent.* in the pre-war period. The proportion has fallen in many States due to the prohibition of cattle slaughter and reasons mentioned in the previous pages.

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* Hides Report.

Madras leads other States in the production of meat and its total production amounts to 124446.4 tons per annum, comprising 32705.4 tons beef, 16473.2 tons buffalo flesh, 43258.9 tons mutton, 22098.2 tons goat flesh and 9910.7 tons pig flesh, representing more than one-fourth of the total Indian production. Uttar Pradesh follows Madras State with an annual production of about 72982.4 tons or 15.8 per cent. to her credit. The third in the list is Bombay State which produces about 70367.5 tons or 15.3 per cent. of the Indian production. The fourth position is occupied by West Bengal which produces nearly 7.6 per cent. or 35160.1 tons annually. Bihar comes next followed by Rajasthan, Hyderabad, Mysore and Madhya Pradesh are other important areas producing respectively 4.4, 3.4 and 3.1 per cent. of the total Indian meat production.

It may be observed that in the marketing of meat in India, beef and buffalo flesh on one hand and mutton and goat flesh on the other are sold more or less at the same price. The pig flesh has a limited market mostly in big towns, and on this account it fetches slightly better price than any other kind of meat in some of the markets in India. The total value of meat produced in India is shown below:—

Value of meat produced in India

	Crores of Rupees.
1. Value of approximately 169,823·7 tons (36·8 per cent) beef and buffalo flesh at the average price of Rs. 40* per maund.	19·0
2. Value of approximately 267,788·3 tons (58·1 per cent) mutton & goat flesh at the average price of Rs. 70* per maund.	52·5
3. Value of approximately 23,633·2 tons (5·1 per cent) pork at the average price of Rs. 70* per maund.	4·6
Total value ..	76·1

It may be observed that apart from dressed meat, certain parts of the carcase and their organs and glands called 'offals' are also commonly sold as meat. Offals are usually divided into two main classes—edible and inedible. The former class includes the tongue, brain, sweet-bread, kidneys, heart, liver, tripe and tail. All of them are rich in flavour, the liver specially being one of the best sources of Vitamin A. Recent studies have shown that kidneys, heart, sweet-bread and brain are nutritionaly superior to meat in some respects.

The chief inedible offals are the hide, hair, bones, horns, and intestines or guts, and they are dealt with separately in Chapter IV. The blood and miscellaneous scraps of meat and fat may also be used for edible or inedible purposes according to circumstances.

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*Average ruling prices 1949-50.

It will be seen that the annual estimated total production of all kinds of meat in India is 4.61.245 tons, valued at roughly 76.1 crores of rupees. If the value of edible offals which are commonly sold along with the meat is added, the total amount would exceed 100 crores of rupees per annum.

Meat retained by producers for domestic use

It might be noted that all the meat produced in the country is not put on the market because certain quantity is invariably retained by the butchers for their own use. It is rather difficult to state with any degree of accuracy the quantities of meat so actually retained by the butchers for their personal consumption. The retention of meat is a variable factor depending upon individual requirements, market demands, seasonal variations etc. etc. The financial position and the size of the family are additional factors in influencing the quantity of meat retained by the butchers. There is, thus hardly any uniformity in the quantity of meat retained by different butchers for their own use.

It is observed that there is a good deal of difference between the urban and rural butchers regarding retention of meat. Since there is a ready demand for meat in the urban areas, the butchers there retain very little for their own use and often when they do so, they retain mainly offals for their consumption. The estimates vary for different areas but on the whole it is learnt that urban butchers hardly retain 1 to 2 per cent. of the production for their own use. Taking 1.5 per cent. as an over all average for the whole India the quantity of meat retained by butchers for their consumption works out to 6918.7 tons.

The net available supply of meat for consumption, thus, in India is 454326.5 tons plus 6918.7 tons retained by producers (butchers) for their domestic use, or a total of 461245.2 tons of meat per annum.

Possibilities of increasing production of meat in India

India has excellent potentialities for expansion of its meat production. It has roughly one-fourth of the world's cattle numbers (including buffaloes), but its beef production is not even one per cent. of the world's total. This low level is partly the result of a low feed supply per animal, and of diseases, but is primarily attributable to religious objections on slaughter and consumption of beef.

As against other countries, cattle in India are neither bred for slaughter, nor are they killed in any appreciable numbers for the supply of beef. For instance, in Italy the number of cattle slaughtered annually represents 44.6 per cent. of the cattle of the country ; in the U.S.A. and U.S.S.R. the proportions are 44.4 and 43.7 per cent. respectively. In India, on the other hand, the annual production of beef represents only 0.9 per cent. of the total number of the country's cattle.

Recently there has been considerable agitation by leaders of public opinion, in the press as well as in the legislatures, against even this small slaughter of cattle, urging that in view of the over all shortage of efficient cattle, their slaughter should be completely banned. By their decision to prohibit the slaughter of useful cattle and unlicensed and unauthorised slaughter of cattle, the Government of India have taken the first step in implementing one of the directives of State policy included in the Constitution. Under Article 48 in part IV of the Constitution, the State is asked to organise agriculture and animal husbandry on modern and scientific lines and, in particular, to take steps for preserving and improving the breeds and prohibiting the slaughter of cows and calves and other milch and draught cattle. In clarification of the State policy on cattle slaughter, the Government of India, Ministry of Agriculture Circular Letter No. F.13-15/49-L, dated the 20th December 1950 *inter alia* state as under:—

"It is clear from the above Article that what is really intended is not a *total* prohibition of *all* cattle slaughter but prohibition of slaughter of cows, calves and other milch and draught cattle only. Milch and draught cattle covers only cattle capable of giving milk or of being employed for draught purposes or in other words "useful" cattle. A total ban on the slaughter of all cattle is thus not an obligation imposed on the States by the Constitution."

Regarding the economic aspect of the matter, this circular goes on to say that, a complete ban on the slaughter of cattle would appear to be wasteful. If enforced, it is bound to lead to a lower standard of cattle life and breeding in the country. India has the biggest cattle population in the world, estimated according to the 1945 Livestock Census (reporting areas only) at 136.7 million heads cattle, excluding 40.7 million heads buffaloes. The cattle Preservation and Development Committee, appointed by the Government of India have expressed the view that 10 per cent. of the total cattle population, *i.e.*, nearly 14 millions, are unserviceable and unproductive and do not give any milk. These useless cattle are generally left by their owners to find their own feed. On the basis of 8 lb. of dry fodder per day per head, it is estimated that these unserviceable and unproductive cattle consume 18.25 million tons of fodder which at Rs. 56 per ton, works out to Rs. 102.2 crores annually. In *Gaushalas* and *Pinjrapoles* alone, it is estimated that about 3.6 lakh of unserviceable and unproductive cattle are being maintained at an annual cost of Rs. 2.4 crores. This enormous expenditure on the maintenance of a large number of unproductive cattle makes it impossible to provide that care, and nourishment to productive cattle which is essential for improving their milk capacity and traction power. The result is that even the productive cattle, which are already small in number, gradually deteriorate and cease to be productive.

From the export point of view also, the problem has considerable significance. Hides from slaughtered cattle are much superior to hides from fallen cattle and fetch a higher price. In the absence of slaughter, the best type of hide which fetches good price in the export markets would no longer be available. A total ban on slaughter is thus detrimental to the export trade and works against the interests of the tanning industry in the country.

The Circular further goes on to say " in view of what is stated above, the Government of India hope that the adverse effects of a total ban on the slaughter of cattle will be realised by the States and in the larger economic and other interests of the country no legal restriction on the slaughter of useless and unproductive cattle will be imposed. States which have already passed legislation totally banning slaughter are accordingly requested to take early steps to reconsider it without first providing a sufficient number of *Go-Sadans* to cattle for all the unproductive and useless animals, it will be inadvisable to have a total ban, which is bound to result in lowering the quality of the country's cattle ". The Cattle Protection and Preservation Committee estimated that a sum of Rs. 24.4 crores non-recurring and Rs. 12.8 crores recurring would be required for the preservation and improvement of cattle in *Go-Sadans*. The proposal visualizes the maintenance of lame, decrepit and other uneconomic animals in remote forest areas where there is no demand at present for grazing and where animals can be allowed to die a natural death. A comprehensive plan, *viz.*, Key Village Scheme.[*] for bringing about a speedy improvement of the cattle wealth of the country had also been recommended by the Planning Commission in their draft plan. As a fore-runner to the scheme, a sum of Rs. 8.62 lakhs was sanctioned for the establishment of 94 Key farm centres during the year 1951-52. Of these, 55 had started functioning and the rest were in the process of being started. These centres would be merged in the All-India Key Village Scheme, which was to come into operation in the current year.

Experience, thus tells us that in devising the means of solving our existing problems, we should keep an eye on the long term; that we should look beyond the immediate future and see to it that the remedies we bring to bear for the easement of present difficulties are calculated also to produce a balanced economic pattern that will stand the test of time. If this is not done and we allow the very magnitude of our problems to drive us into ill-chosen course, then we run the risk of developing a form of organisation which may prove to be out of harmony with future needs. While, therefore, religious sentiment suggests a ban on cow-slaughter, it is difficult to see why efforts should be wasted on preserving other useless animals. The problem must be viewed from a practical economic angle. The correct solution would then seem to be to preserve useful cattle at all costs and so to improve the animals' health and breed as to ensure, for the country in the course of time, all the milk it needs and all the efficient animals its agriculture requires and yet leave an adequate surplus to yield meat, hides, skins and bones. It is, therefore, suggested that the ban on the slaughter of cattle should for the time being, be strictly confined to those categories of cattle, which are useful for breeding, milk production or any other work.

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[*] Food Bulletin, Vol. 7(18), August, 1952.

So far as mutton, goat and pig flesh is concerned India can easily plan to increase its production very considerably. The conditions are conducive to expansion as sheep and goats are easily reared while pigs are raised with little care or feeding. The former tend to increase in number somewhat more rapidly than cattle, because it is more common for them to produce twins twice a year, whereas the latter being prolific produce litters out of which 5/6 pigs per litter have been saved in recent years. Thus, the production could be substantially increased without much serious efforts, in less time than with cattle. Increased meat production is also predicated on increase in indigenous foodstuffs as it is a well known fact that by proper and judicious feeding alone the meat yields of such animals as sheep, goats and pigs, could be increased substantially. Undergrown and poor developed pigs are known to have been fattened in three months time when fed with corn meal and plenty of skim milk.

The success which is being achieved in upgrading the local indigenous breeds of sheep, goats and pigs with improved strains and selective breeding, should also make possible an increase in numbers and improvement in their quality and meat yields.

As it is, the production of meat is at a very low level, in spite of the fact that there is an increasing demand for mutton and goat flesh in this country. Pork is also becoming increasingly popular. This is largely because it can be manufactured into different kinds of products, can be cured in different ways, and can be stored more satisfactorily than any other meat. Pork carcases also possess the highest proportion of fat, and the rendered fat or lard can be a very useful and potential source of fat so deplorably deficient at present in India. Unfortunately, the importance of building up a progessive meat industry has not been properly realised with the result that sheep, goat and pig farming is yet in a state of infancy in this country. What is needed, is not so much to produce more animals as to improve the efficiency of production and consequently to increase the output per animal. Special attention should, therefore, be given to better breeds, better methods of feeding, better control and more intensive action against animal diseases, rationalization of animal feeding, amalgamation of scattered holdings, together with development of a better feed supply and better use of grass lands and pastures. In a predominantly agricultural country like India where the vast majority of people subsist on a diet which is very deficient, the importance of developing high meat yielders cannot be over-emphasised. The whole question must be tackled by the Government as part of their plan for increasing the food production of the country. With present shortage of foodstuffs in India, the huge consumption of rice and wheat *per capita* could be reduced to some extent by introducing meat as an essential food. With present world meat shortage, India could, easily find a good export market as well.

C.—Trend of meat production

The number of cattle, buffaloes, sheep, goat and pigs slaughtered tend to vary from year to year. There are no records to show what were the conditions of production and supply of meat in the past. There have been a few sporadic attempts to estimate the production of meat in some areas but they were not generally the results of so extensive an enquiry as the present one. The previous figures, therefore, cannot be used in comparison with the present ones for studying the trend of meat production in any one part of India, much less for the whole country.

The trend of production depends on two main points. Firstly, what has been the increase or decrease in the number of cattle, buffaloes, sheep, goats and pigs say during the past ten years since production of meat has a direct bearing on livestock numbers. Secondly, has the yield per animal improved, remained stationary or diminished during the same period. There have been to-date six quinquennial livestock censuses but the areas of enumeration have not been the same. The last Census which was with some important exceptions held in January 1945 was more comprehensive than that of 1940, as almost all the then provinces and States participated therein. Though it is not strictly comparable, an idea may, however, be formed by studying the trend of livestock population shown in the table below :—

TABLE NO. X

Trend of livestock population—pre-partitioned India

(in lakhs)

Kind of livestock	1940	1945	Percentage increase or decrease over 1940
Cattle	1,628	1,599	— 1·8
Buffaloes	454	462	+ 1·8
Sheep	490	436	— 11·0
Goats	594	559	— 5·9
Pigs	28	38	+ 35·7
Total ..	3,194	3,094	— 3·1

From the above figures it is evident that in 1945 the number of cattle decreased by about 1.8 per cent. while the population of buffaloes has increased by about the same per cent i.e. 1.8 per cent. The sheep and goat population has also decreased by 11.0 and

5.9 per cent respectively during the quinquennium ending 1945. The pig population shows an increase of 35.7 per cent during the above period. It may be noted that pigs were not being recorded in livestock censuses previous to 1940. The high percentage increase in pigs over 1940, may be due to more comprehensive recording and much larger area *viz.* 92 per cent. covered in 1945.

Taking the total figures for the two censuses, it will be seen that there is an over all decline of 3.1 per cent. over the 1940 figures. This is mainly ascribed to the large scale slaughter during the war period. The conclusion is in conformity with the general belief that during the last World War II, large scale slaughter was going on all over the country to meet the increased military demand. This is confirmed further by available figures shown below:—

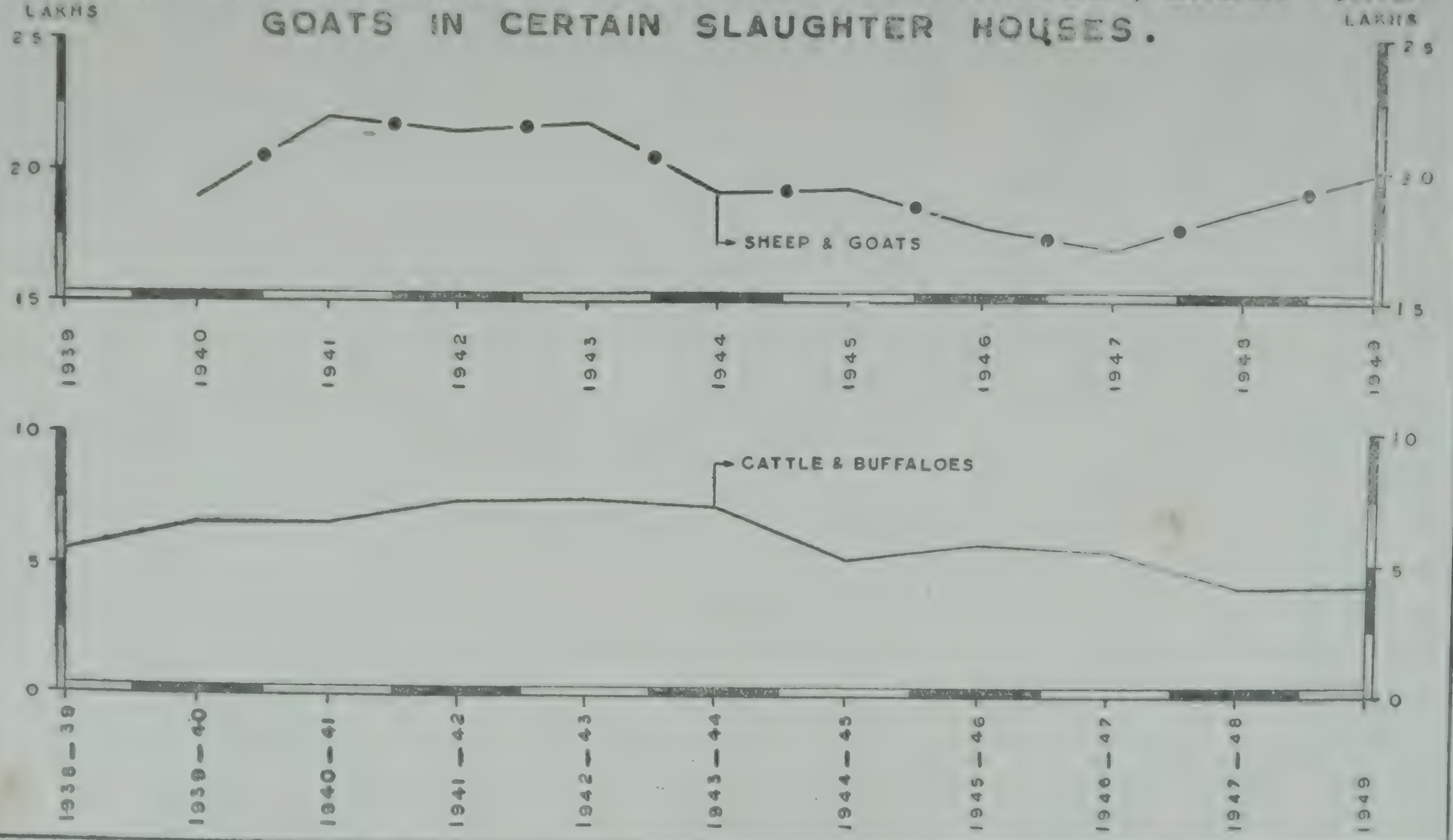
TABLE NO. X-A

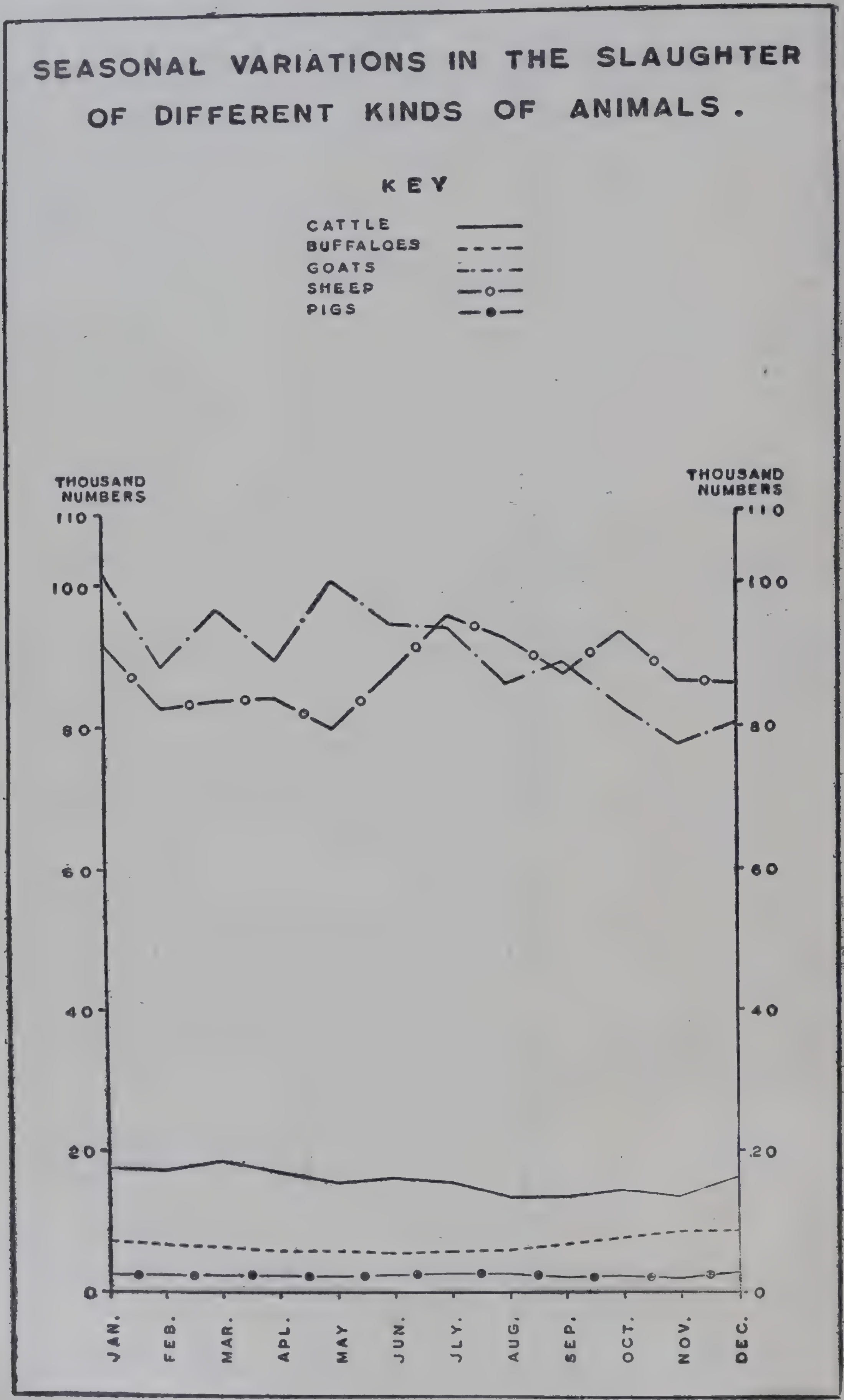
Number of cattle slaughtered in military butcheries

Year	Numbe slaughtered
1940	47,883
1941	73,524
1942	222,417
1943	265,396
1944	183,974
1945 (9 months)	142,110

It will be seen that in military butcheries 47,883 cattle were slaughtered for defence services in year 1940. In 1941 this went up to 73,524, and the number jumped upto 2,22,417 and 2,65,396 animals in years 1942 and 1943. In 1944, however, the number decreased to 183,974 and in first 9 months of 1945 it stood at 142,110. This diminution in the proportion would not be so serious if the quality of the food animlas had improved particularly with regard to their meat supply. Unfortunately the common run of animals in villages has remained much the same, management methods are unaltered and public opinion still tends to be unreasonably conservative clinging to out-of-date and age-worn traditions.

TREND OF SLAUGHTER OF CATTLE & BUFFALOES, SHEEP AND GOATS IN CERTAIN SLAUGHTER HOUSES.





SEASONAL VARIATIONS IN THE SLAUGHTER OF DIFFERENT KINDS OF ANIMALS.

Long range figures for all-India are not available, but the trend of cattle and buffalo slaughtering in some of the important cities can be seen in the table below:—

TABLE No. XI

*Number of cattle and buffloes slaughtered in certain slaughter houses**

Year	No. of cattle and buffaloes slaughtered (Lakhs)	Percentage increase or decrease over 1938-39
1938-39	5·45	..
1939-40	6·47	+ 18·7
1940-41	6·51	+ 19·4
1941-42	7·43	+ 36·3
1942-43	7·47	+ 37·1
1943-44	7·16	+ 31·4
1944-45	5·12	— 6·1
1945-46	5·70	+ 4·6
1946-47	5·51	+ 1·1
1947-48	4·10	— 24·8
1949	4·18	— 23·3

As revealed by the above figures and the diagram facing page 32, that the number of Cattle slaughtered increased progressively from year to year during the war until it reached its peak in 1942-43. This was mainly due to an increased demand for this class of meat from a large number of troops stationed in India during war period. The number decreased by more than 2 lakhs in 1944-45 partly due to the rise in prices of livestock and partly due to the departure of large number of foreign troops from the country as also imposition of certain restrictions imposed on slaughter of cattle as a result of hue and cry raised at the indiscriminate slaughter that was taking place in the country. The slaughtering remained more or less stationary during the next two years. Since 1947-48 there is a drop again by nearly 24 per cent. obviously partly due to the unprecedented upheaval in the country in the wake of partition and consequent migration of a large percentage of beef eating communities to Pakistan, and partly because of the stoppage of cattle slaughter in certain areas by legislation and voluntary giving up of killing in other areas.

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*Calcutta, Madras, Punjab recognised slaughter houses, Bombay and U.P. Urban areas.

Annual slaughter figures of sheep and goat for ten years ending 1949 at some of the important slaughter houses in India are shown in the following table:—

TABLE NO. XII

*Number of sheep and goats slaughtered in certain slaughter houses**

Year	No. of sheep and goats slaughtered (Lakhs)	Percentage increase or decrease over 1940
1940	18·83	..
1941	21·90	+16·3
1942	21·33	+13·3
1943	21·65	+15·0
1944	19·10	+1·4
1945	19·26	+2·3
1946	17·71	—5·9
1947	16·91	—10·2
1948	18·54	—1·5
1949	19·87	+5·5

It will be seen from the above table and the diagram facing page 32 that though in 1949 the slaughtering increased by about 5.5 per cent. over 1940, it could not reach the peak year level of 1941 (about 22 lakhs). During this year (1941) it suddenly increased over 1940 figure indicating an advance of about 16 per cent. During the following two years *viz.*, 1942-43, slaughtering was maintained at a quite high level though comparatively lower than 1941 figure. From 1944 onwards the slaughtering declined and the minimum figure was noticed in 1947 *i.e.*, 10.2 per cent. less than that in 1940. During 1949 the slaughtering increased again and was about 7.2 per cent. more than that in 1948.

The reason for the sudden increase in the slaughtering in 1941 over 1940 may be attributed to the influx of large number of military personnel in the various important cities of India. Decline in slaughterings in 1944 and 1945 may be due to the gradual dispersal of British troops from India, as also prevailing high prices for livestock. Further decline in 1946 and 1947 may have been caused by the withdrawal of British troops and also attributable to the post-partition causes. The increased slaughtering in 1949 is due to the return of the normal and settled conditions in the country.

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* Ahmedabad, Amritsar, Bangalore, Calcutta, Delhi, Hyderabad City, Kanpur, Lucknow Poona and Sholapur.

No precise information is available in regard to the changes that may have taken place in the meat yielding capacity of various food animals slaughtered for meat production. The opinion of those who have been in the trade for long time, is rather conflicting but the general concensus of opinion seems to be that the meet producing capacity of all food animals has generally deteriorated inasmuch as it is not so very easy now-a-days to obtain good quality cattle, sheep and goats as was the case some years ago. The main reason seems to be that, with the great increase in human population which has taken place within the last 30 years, the pressure on the land has considerably increased and much of the land previously available for pasture has been brought under the plough with the result that not many of the grazing grounds and fields are left for them to browse upon. It is also generally agreed that the net output of production from all food animals in India is proverbially one of the lowest in the world. The reasons for this low efficiency are not far to seek. Inadequate feeding, indiscriminate breeding and indifferent management, all combine to contribute to this state of affairs.

Various enquiries made in some of areas during the present survey have given an indication that the pattern of meat production has considerably changed in India in recent years. While the beef and buffalo flesh production show a marked decline from 1945 onward due to variety of reasons such as imposition of restrictions on slaughter of certain categories of food animals, withdrawal of British troops, and large scale migration of beef eating communities to Pakistan, the mutton and goat flesh show a distinct upward tendency. This may be attributed to the increasing popularity of meat consumption amongst the masses and the enormous rise in prices of vegetables in relation to meat prices in recent years. The increase in meat production, however, has not kept pace with increase in human population which has increased by 15 per cent during the decade ending 1941 and roughly 13 per cent during the decade ended 1951. The human population in towns and cities has increased by leaps and bounds during the past few years but in general the supply of meat has been insufficient to meet the increased demand.

Famine, disease and floods are some of the other factors which may adversely affect the production of meat. Apart from the chronic famine which prevails in many parts of India, hardly a decade passes without the visitation of famines devastating different parts of India. In the 1937-39 famine, the severest in living memory, animals died of starvation by thousands and those survived suffered from different types of diseases. The number of animals that died is not known with the result that the effect of famine on the number of cattle, sheep and goats cannot be properly judged, but there is no doubt that the mal-nutrition resulting from these famines must have had an adverse effect on the quality or quantity of meat obtained from them.

Similarly, the mortality due to contagious and other diseases, as also floods during which many a cattle sheep and goats are carried away in the torrents and streams may be responsible to certain extent for affecting the meat production but the details about their incidence are not properly known.

Aside from the above factors, the production of meat may be affected by the demand for hides in case of cattle and buffaloes and wool and pelts in case of sheep and goats.

D.—Seasonal variations in production

The seasonal variation in production of meat is not quite pronounced because the slaughter of food-animals is more or less uniformly regulated throughout the year according to the demand. However, the general behaviour of the seasonal variation slightly varies with different kinds of meat, *viz.*, beef, buffalo flesh, mutton, goat flesh and pork. Generally speaking the production of meat is more in cold weather than in hot months.

During summer *i.e.*, April to June, production is rather low, because many people generally believe that partaking of meat has heating effect and its use, therefore, is somewhat restricted during these months. Low production of meat in summer is also a way due to the scarcity of green foliage and fodder for sheep and goats and cattle. The buffaloes particularly feel the severity of the climate as there is scarcity of grazing and water for wallowing. During this period, food animals usually lose weight and condition and meat yields get reduced, on which account large number of animals are not slaughtered. In this season, the production of meat is also at its minimum because of plentiful supply of mangoes, melons and other fruits which are consumed in larger quantity in preference to meat.

With the commencement of the rains, the meat production gradually revives, although heavy floods at times may adversely affect the supply. The production increases in winter months due to cold weather and festivals like Christmas, etc.

The seasonal production of different kinds of meat in a few important areas can be seen from the tables below and the diagram facing page 33, but it must be remembered that these tables merely show the approximate seasons for the maximum and minimum production in certain selected centres and the highest and lowest levels may not occur exactly during the months indicated as above in other centres in India:—

TABLE NO. XIII

Seasonal variations in the slaughter of cattle and buffaloes
(1948-1949)

Months	No. of cattle slaughtered*	Percentage to total	No. of buffaloes† slaughtered	Percentage to total
January	17,459	9·3	7,124	9·0
February	17,093	9·1	6,543	8·2
March	18,476	9·8	6,135	7·7
April	16,997	9·0	5,784	7·3
May	15,562	8·3	4,769	7·3
June	16,024	8·5	5,496	6·9
July	15,422	8·2	5,643	7·1
August	13,523	7·2	5,805	7·3
September	13,547	7·2	6,559	8·2
October	14,486	7·7	7,540	9·5
November	13,481	7·2	8,515	10·7
December	16,049	8·5	8,572	10·8
Total	188,119	100·0	79,485	100·0

* In Bombay, Hyderabad, Madras and Madhya Pradesh slaughter houses.

† Bombay, Calcutta Madras, Agra, Bihar and Madyha Pradesh slaughter houses.

It will be seen that in case of beef, the highest production takes place in December-March, due to cold weather and festivals like Christmas, Easter, etc. The lowest slaughter takes place in September, October and November. This is probably due to ready availability of fish an these months. The highest production of buffalo fiesh takes place in November and December, due to the heavy demand for this class of meat in cold weather.

TABLE NO. XIV

Seasonal variations in the slaughter of sheep and goats
(1948-49)

Months	No. of goats slaughtered*	Percentage to total	No. of sheep slaughtered	Percentage to total
January	101,621	9·4	91,433	8·7
February	88,328	8·2	82,438	7·9
March	96,496	8·9	83,582	8·0
April	89,110	8·3	83,949	8·0
May	100,195	9·3	79,617	7·6
June	94,241	8·7	87,272	8·3
July	93,706	8·7	95,333	9·1
August	85,912	8·0	92,265	8·8
September	88,818	8·2	87,235	8·3
October	82,791	7·7	93,024	8·9
November	77,257	7·2	86,104	8·2
December	80,183	7·4	85,762	8·2
Total ..	1,078,658	100·0	1,048,014	100·0

It will be seen from the above figures and diagram facing page 33 that in case of sheep the slaughter is more or less uniform with little more pronounced slaughter after rains *viz.*, July-October. This may also be due to the fact that green grazing is available everywhere after the rains and this helps the sheep to pick up condition and they may be slaughtered more on this account.

In case of goats, it will be seen that the maximum production occurs during January and May and the lowest level is reached during October, November and December. It is observed that the kidding in goats is adjusted to suit the seasonal conditions. It is generally avoided during the wet season and most of it occurs in the months of March and October. The kids are slaughtered only when sufficiently grown. The goat flesh production is generally available in greater quantity during May and January *i.e.*, about 2 to 3 months after kidding season. The lowest slaughter in October-December is due to readily availability of fish in these months.

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*In Amritsar, Madras, Calcutta, Agra, Bangalore, Poona, Delhi, Nagpur, Hyderabad and Simla slaughter houses.

TABLE No. XV

Seasonal variation in the slaughter of pigs (1949)

Month	No. of pigs slaughtered*	Percentage to total
January	2,313	8·4
February	2,338	8·5
March	2,248	8·2
April	2,230	8·1
May	2,106	7·7
June	2,245	8·2
July	2,584	9·4
August	2,541	9·2
September	2,028	7·4
October	2,133	7·8
November	1,942	7·1
December	2,758	10·0
Total ..	27,466	100·0

It will be observed from the above figures and diagram facing page 33 that in case of pigs the highest slaughter is in December, mainly due to heavy demand for this class of meat due to cold weather and important festivals like Christmas.

Apart from these seasonal factors, festivals like 'Id', Christmas, Holi etc. may influence the meat production. India is a land where festivals are observed with great eclat. The village, town or city goes into merry-making and feasting on such occasions, most of which have a religious significance. Innumerable shops of all sorts, particularly eatables, spring up overnight to cater for the visitors. Most of these shops make use of meat in their various preparations with the result that demand for meat is considerably increased for a short period. On the other hand there are certain months as well as days on which some communities observe fast or abstain from eating meat on which account the production of meat is temporarily somewhat reduced on such occasions. In spite of such variations, the production of meat in actual practice, does not fluctuate to any appreciable extent from month to month.

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* In Bombay, Calcutta, Madras and Madhya Pradesh slaughter houses.

E.—Inter-provincial trade

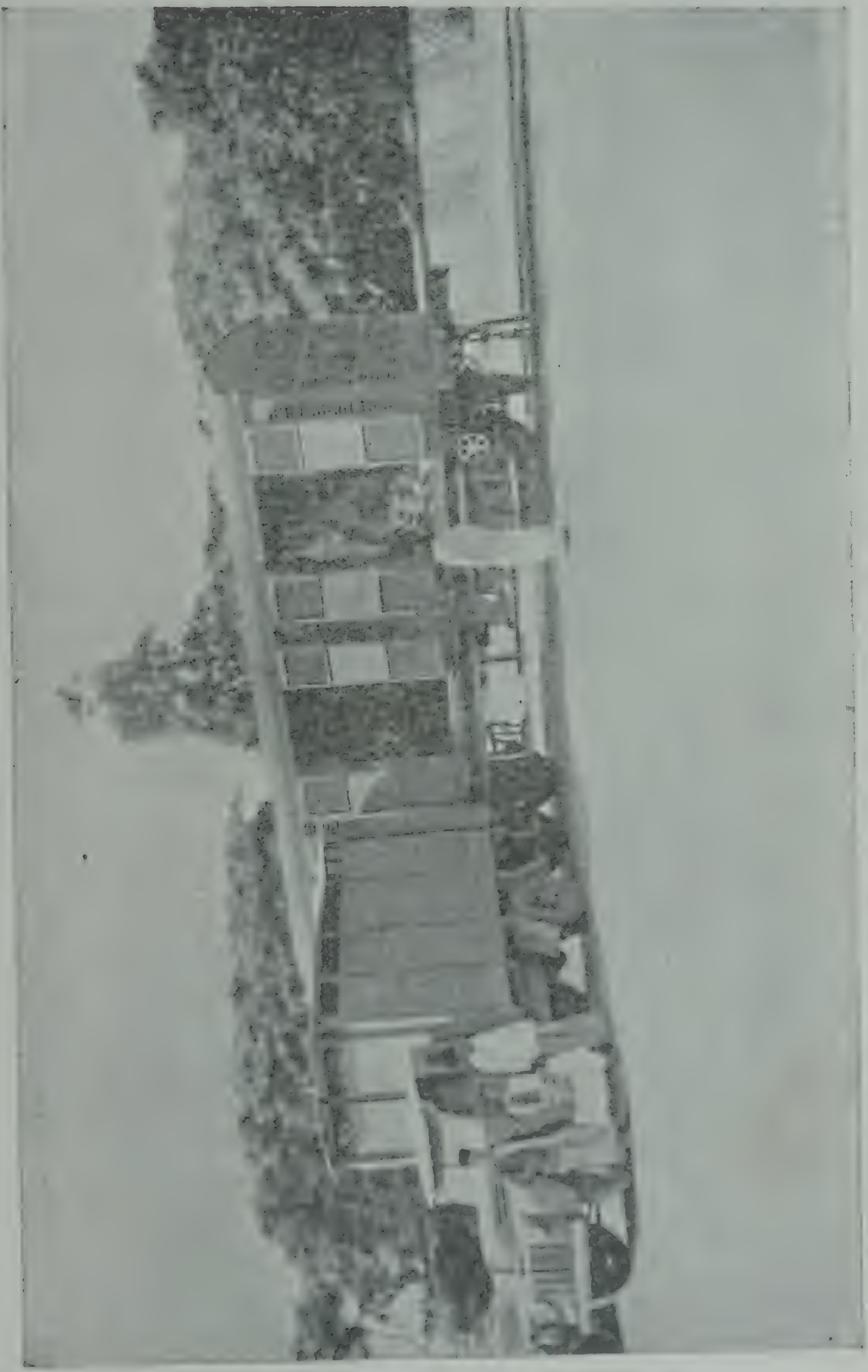
Meat being an easily perishable commodity, the inter provincial trade in meat is not of much significance. There is practically no import of fresh meat from one State to another by road, river, rail or sea excepting Mysore State which obtains small supplies of beef from its neighbouring State of Madras (*see* plate facing this page). There is a ban on the slaughter of cattle in Mysore State and it is reported that about 300 tons of beef are annually imported into Mysore State at Bangalore and Kolar gold-fields from Madras by train for consumption in these two towns. Likewise a very small quantity of processed meat (bacon, ham, sausage, etc.) is imported at some of the imported consuming centres like Delhi, Simla, Ranchi, etc., mostly from Uttar Pradesh, but the quantity so imported is indeed very small hardly some 200-300 maunds per annum. Before the partition a very small quantity of processed meat (bacon and ham) used to be exported from Bihar to certain places in Bengal during the winter. The quantity so exported was very meagre and after the withdrawal of the large number of Europeans and allied communities from India, this export has very much more dwindled down.

F.—Imports and exports of meat and meat products

(1) Imports

For obvious reasons, there is no import of fresh or raw meat into India. However, preserved and processed meat, particularly ham and bacon, used to be imported into India in fairly large quantities at port towns like Bombay, Calcutta and Madras, chiefly from United Kingdom, United States of America and Holland before the war, but their imports have steadily decreased during and after the last war and they are relatively of little importance now, amounting on an average of the past three years some 1,340 cwts. valued at Rs. 3,15,129 per annum. This stuff is largely used and patronised by Europeans, Anglo-Indians and allied communities and certain classes of westernised Indians who have developed a taste for these kinds of meat.

Facing page 40]



Unloading of beef carcases at Bangalore from Madras.

The table below shows the imports and values of ham, bacon etc. into India for the last 14 years, period ending 1950-51: —

TABLE No XVI

Imports of ham, bacon etc. into pre-partitioned India

Year	Quantity (Cwts)	Value Rs.
1937-38	16,895	12,47,681
1938-39	16,810	12,87,386
1939-40	12,898	11,96,340
1940-41	8,661	8,78,531
1941-42	12,049	12,74,756
1942-43	1,080	1,25,622
1943-44	268	51,715
1944-45	542	89,561
1945-46	258	37,823
1946-47	1,467	2,03,88
1947-48	1,587	2,38,301
India 1948-49	2,628	6,06,830
1949-50	1,363	3,29,813
1950-51	30	8,744

(2) EXPORTS

Just as import of meat into India is insignificant, its export also is equally unimportant. There is very limited quantity of meat taken by ships at port towns for use on their voyages. The larger passenger steamers generally take some 1000/3000 lb. and the smaller ones about 500 to 1000 lb. per trip. The supplies are made through Stevedores who purchase the same on contract basis from the local butchers. Exact data for all India is not available but it would appear from figures in (Appendix IX) that during the year 1945—49, on an average roughly 759 thousand lb. beef, 411 thousand lb. mutton and goat flesh and 109 thousand lb. pork were taken by ships, principally from port towns like Bombay, Madras and Calcutta.

Lately there has been some demand for Indian frozen beef from Hongkong, China and other neighbouring places due to the Korean War and other disturbing factors in those areas. Enquiries made go to show that during 1950-51 and 1951-52 on an average over 500 tons of Indian frozen beef were exported to those countries.

A small quantity of processed meat (ham and bacon) is also exported by way of home delivery parcels to United Kingdom and other places but the quantity so exported is negligible. There would, however, appear to be very good opportunity for developing this trade, particularly to Far East Countries, if only the Indian products could be improved and standardised. The type of cure also would depend upon the quality of meat to be processed, climate and the nature of requirement for meeting the demand of the overseas markets.

Before the World War II, there existed a small trade in sun-dried beef and buffalo flesh called 'biltong' between India and Burma and it is understood that roughly some 536 cwts. on an average per annum were being exported mostly from Uttar Pradesh and Delhi State. Though the war is over and this market is once again open, yet there appear to be no prospect of reviving this trade because of the existing very strong feelings against slaughter of cattle in the country.

Although India is one of the largest goat-raising countries in the world and also produces some of the finest qualities of sheep, yet the quantity of goat flesh or mutton exported overseas is practically negligible. This is due to the fact that India has not specialised in goat and sheep-raising for meat production. U.K. imports large quantities of this meat in a frozen condition. The process of freezing does not impair the quality of mutton or goat flesh, as it does the quality of beef, so that there is ample scope for exploitation of this market, apart from other Far East Countries. Regularity and continuity of supply combined with standardised product are most important factors in the attainment or success in these markets and it cannot too strongly be impressed on the producer the advantage he will derive from close attention to these points.

G.—Utilization of meat

General

For thousands of years, meat has been a pillar of the human diet. Primitive man chose it instinctively if not through necessity. At first, it was a matter of securing meats from the wild animals; later, animals were domesticated and eventually used for power and recreation as well as for food and clothing. Almost all the primitive people had the legend in some form or other that the roast of sheep and goat was accepted as an offering to their deities. In ancient Assyria, meat preparation was held semi-sacred, and only the priestly order could engage in it; and in Egypt the food laws stipulated that the priests should serve as judges of meat. In India, in West Bengal and many other places, even to-day goat carcases and their meat are offered to the deities notably Kali as a gift of their most precious possessions.

One can merely conjecture that meat cookery was practised soon after the use of fire in the old stone age (Paleolithic period). Charles Lamb, in his "Dissertation on Roast Pig", gives the legendary account of how the world owes the discovery of roast pork to a naughty Chinese boy. One day Bo-Bo accidently burned down his father's cottage, and with it a litter of young pigs that were sleeping underneath were burned to death. Perplexed and fearful of what would happen when his father returned, Bo-Bo stooped to feel one of the roasted pigs, burned his fingers, and to cool them popped them into his mouth. He found the roast pork delicious. Then the fantastic story goes on to say that every time the Sow farrowed, Bo-Bo's father's house was sure to be in a blaze. Moreover, the practice spread throughout China until some wise old Chinese philosopher discovered that it was not necessary to burn the house down in order to get roast pork.

First and foremost, people eat meat because they like it. They derive a rich enjoyment and satisfaction therefrom. For flavour, variety, and appetite appeal, meat is unsurpassed.

But meat is far more than just a very tempting and delicious food. From a nutritional standpoint, it contains certain essentials of an adequate diet. The nutritive qualities of meat may be summarized as follows :—

(*a*) It is the most concentrated and easily assimilated of nitrogenous food, and is a good source of first class proteins, *i.e.*, it contains those amino-acids which are essential for human life ; (*b*) it assists the body in the production of heat and energy ; (*c*) it is satisfying for the presence of fat in the diet delays emptying of the stomach. Meat contains fat, and therefore, remains in the stomach for some hours and allays hunger, and (*d*) after suitable treatment which includes the process of ripening and cooking, meat acquires a palatable flavour, acts as a stimulant to gasteric secretion and is readily digested. Meat is also a rich source of several minerals but is especially good as a source of phosphorus and iron. Phosphorus combines with calcium in building the bones and teeth. Iron is necessary for the building of blood, and its presence protects against nutritional anemia.

Recent researches have shown that meat is one of the richest sources of the important B group of vitamins. Three valuable vitamins of this group are thiamine, riboflavin, and niacin—the vitamins now being used to reinforce certain foods and which are indispensable in our daily diet. The thiamine stimulates appetite, prevents beri-beri, aids in the utilization of carbohydrates, and promotes the health of the body cells. Riboflavin is necessary for cell oxidation and protects against nervous disorders and also liver disturbances. Niacin prevents and cures pellagra, a diet deficiency disease which has afflicted hundreds of thousands of persons in many countries.

The important part that meat is playing in the nutrition of the nation is, therefore, being realized in greater measure. It should play an even greater part in this country for our population is now failing to receive an adequate diet to maintain health and vigour.

(1) FOR CONSUMPTION AS FRESH MEAT

Almost all the meat that is produced in India is utilised for consumption as fresh meat, since the use of meat for any other purpose is not in vogue in the country. Meat is cooked largely to kill certain microorganisms naturally associated with it and to render it more palatable. There are several ways to accomplish the necessary beating and wrapped in this fundamental process are all the arts of the culinary skill. As a general rule meat shculd be cooked in such a way as to retain its nutritive value.

Broadly speaking there are two ways to cook meat: (1) by dry heat and (2) by moist heat. In general, dry heat is used for the more tender cuts and moist meat for those less tender. The cooking temperature is important. Low-temperature cooking generally result in a smaller cooking loss, greater juiciness, more uniformity of cook, and requires a longer time. In general, meat cooked at low temperature does not brown as attractively as meat cooked at higher temperatures. Meat is eaten in a variety of ways, but the most common form is to cook and season it with onions, greens and other spices. Meat when cooked with rice is called "*Pulao*" or "*Biryanai*". It is roasted and fried in various forms such as chops, cutlets, steaks, etc., spicy curries are also made from meat. Many delicious dishes like *Koftas, Kababs, Puffs, Patties*, etc., are made from minced meat. Meat is further used for making soups, broths, sandwiches etc. etc.

Likewise, edible offals go into consumption mostly as fresh meat. Tongues are generally used fresh, but sometimes they are cured or smoked. Brains and sweet breads are sold fresh, although valuable medicinal gland extracts are also obtained from the latter. The heart, lungs and trachea are generally utilised with other edible meat scraps. Livers and kidneys find a ready consumption in a fresh state. The first and second stomachs of cattle (rumen and reticulum) are cleaned and trimmed for sale as tripe. Although cheap, nutritious and easily digested, tripe is considered in some quarters, to be a degrading dish on which account it is mostly used by labour and poor class people. Ox-tails are marketed fresh—ox-tail soup being a popular delicacy amongst European and Christians.

From the marketing standpoint the effective demand for consumption as fresh meat and meat products is mostly urban in character. In towns and cities where the family income is expected to be more and standard of living generally higher than in rural areas, there is a regular demand for meat and its various preparations, not only in greater quantities but from a larger section of the population.

The rural demand for meat is relatively poor in the sense that there are not many purchasers of meat in the villages. The reasons are that many of the consumers themselves are the producers while due to the comparative low purchasing power of the Indian peasantry, many cannot afford to purchase and consume meat.

It is difficult to give any accurate figures to show the ratio between the urban and rural consumption, because as already stated elsewhere, most of the sub-divisional towns even do not maintain any records of animals slaughtered within their limits, what to speak of the conditions in the rural areas. A considerable number of animals are also slaughtered privately and their record is not available. However, from the available data, it is fairly well established that the consumption of meat in the urban areas is greater than in the rural areas. It is observed that those living in cities and towns generally consume more meat than their counter parts in the mofussal. Taking all the four kinds of meat together, namely beef, buffalo flesh, mutton and goat flesh the ratio between the urban and rural areas works out roughly to 52 to 48. The table below gives an idea of the ratio between the urban and rural consumption in certain areas in India:—

TABLE No. XVII

Number of cattle and buffaloes slaughtered in urban and rural areas in certain States

(lakhs)

States	Cattle			Buffaloes		
	Urban	Rural	Total	Urban	Rural	Total
Bombay	1·16	0·49	1·56	0·47	0·08	0·55
Hyderabad	0·66	0·22	0·88	0·07	0·05	0·12
Madhya Pradesh ..	0·42	0·02	0·44	0·07	Neg.	0·07
Madras	0·90	3·17	4·07	0·23	1·00	1·23
Uttar Pradesh ..	0·57	Neg.	0·57	2·02	0·76	2·78
West Bengal	1·11	0·69	1·80	0·23	0·01	0·24
Total ..	4·82	4·59	9·41	3·09	1·90	4·99
Percentage of urban and rural to total.	51·3	48·7	100·0	62·0	38·0	100·0

TABLE NO. XVIII

Number of sheep and goats slaughtered in urban and rural areas in certain States

(lakhs)

States	Sheep			Goats		
	Urban	Rural	Total	Urban	Rural	Total
Bombay	10·43	7·76	18·19	9·58	15·33	24·91
Coorg	0·11	Neg.	0·11	0·06	Neg.	0·06
Hyderabad ..	1·87	1·01	2·88	6·55	1·04	7·59
Kashmir	0·86	1·75	2·61	0·68	2·19	2·87
Madhya Pradesh ..	0·66	0·65	0·31	2·30	6·10	8·40
Mysore	3·74	7·00	10·74	2·27	4·00	6·27
Orissa	0·31	0·80	1·12	0·53	1·31	1·84
Punjab	0·93	0·63	1·56	2·54	3·81	6·35
Uttar Pradesh ..	10·00	2·50	12·50	21·48	7·16	28·64
West Bengal ..	1·28	0·98	2·26	3·89	10·25	14·14
Total ..	30·19	23·08	53·27	49·88	51·19	101·07
Percentage of urban and rural to total.	56·7	43·3	100·0	49·4	50·6	100·0

Many factors are responsible for variations in the kind and amount of meat consumed. These include variations in income, price of meat, size and composition of the family, occupation, season of the year, race and religion. Some of these factors appear to exert an important influence on the amount of meat consumed; others have much less significance. The demand largely varies somewhat according to the class or social status and the income of the prospective buyers or consumers. People with lower incomes purchase relatively small supplies of mutton. The price of meat is thus the limiting factor, and the total effective demand for all these five kinds of meat is partly dependent on price and the incomes of potential buyers. Rates of wages and employement conditions, specially the ratio of unemployment to total workers have an obvious effect on demand but with any state of general economic conditions, the relative demand for beef, buffalo flesh, mutton, goat flesh and pork is dependent on their relative prices.

Meat is consumed all the year round though climatic conditions determine the demand to certain extent. The consumer's demand for all kinds of meat generally increases as a week progresses and reaches its maximum on Saturdays and Sundays. The normal demand for meat varies to some extent from season to season and especially between winter and summer. Due to the availability of cheap mangoes, melons and other fruits, the demand for meat gets reduced in summer. Mutton and goat flesh in contrast to beef and pork are considered light and less heating and on this account the demand for latter somewhat falls off in summer months and increases in cold weather.

The trend of consumption in case of mutton and goat flesh as compared to beef and buffalo flesh in recent years shows a gradual upward tendency. The increase is more marked and regular in the case of goat flesh than that of mutton excepting in areas which are either predominantly Muslim or have a large cosmopolitan population such as Europeans, Anglo-Indians and Parsees in cities and cantonments like Bombay, Calcutta, Bangalore, etc. Goat flesh is given preference because it is comparatively less heating and contains a lesser percentage of fat.

Beef on account of religious and other reasons is not eaten by Hindus and on this account the consumption has considerably fallen off since partition of the country.

Pork though considered to be the best meat in Europe, America, China, Japan and other countries, where there is no religious prejudice against it, is not yet very popular in India. Its high cost rather puts it out of reach of any but the well-to-do. Of course, one must also acquire a taste for it, but that once acquired is always desired. The consumption is, however, on the increase.

Notwithstanding certain difference of demand in different parts of India, it may be stated that a general change is also in progress in the prevailing taste. A liking for smaller and leaner cuts in place of fat, and heavy joints, is observed in the demand for most meats. The lean type of bacon and ham and small cuts of beef and mutton are now fairly established. They are becoming increasingly popular in many of the large towns. The urbanisation of the population, the small size of families and the desire for more varied diet have all tended to turn the demand from large and heavy joints to the smaller and leaner ones.

The consumption on the whole appears to be on the increase due to general rise in wages, as also to somewhat greater recognition of the nutritional value of meats. Apart from that there are extractions in meat which have a stimulating effect, perhaps most important fact is that meat and similar proteins remain longer in the stomach than other types of food and therefore they leave a sense of satisfaction to the men working hard. There is thus, an ample scope for greater utilisation of meat and making it more popular especially mutton, goat flesh and pork. Happily, there is no serious prejudice now against these meats as was the case in earlier times. All meat eaters would like to eat more meat but a great majority of them cannot afford it. If mutton and goat flesh in particular could be had at a cheap price, there seems to be no reason why people will not eat it in large quantities and appreciate the value of this useful product as an article of food.

(2) FOR PRESERVATION

Meat excepting pork, is not preserved anywhere in India on any commercial scale. In some places, however, like Assam, small quantities of mutton are dried in the sun or pickled in brine for consumption. Small quantities of beef are also preserved and processed in winter called "Hunter beef". Only the buttock or rump portions of the carcase are used for this purpose and it is mostly prepared on special demand from the European and Anglo-Indian communities. The business is generally in the hands of illiterate and poor class of people and their methods of preparation are rather primitive and crude and no attempt is made to improve the quality.

The pig flesh being most palatable, is preserved and processed into a few different products such as ham, bacon and sausages; as also because this can be kept for a longer time and stored more satisfactorily than any other meat. These products are, however, still considered as luxury foods and as such the demand is mostly limited to urban cities like Bombay, Calcutta, Madras and Delhi. There are hardly few piggeries in India, principally in Simla, Aligarh, Calcutta, etc. which manufacture these processed products. Pickle made out of pork is also sometimes prepared in certain States like P.E.P.S.U. and Rajasthan. The processing is, however, done on very small scale. Every curer has his own favourite recipe to determine the exact strength and composition of the pickle or brine, although the ingredients are generally known to be common salt, salt peter and a small amount of sugar.

Likewise canning of mutton products such as (1) Mutton and *Kofta* curry, (2) liver curry and (3) *Kiema* (minced meat) and Peas on a small scale (about 4000 cans weighing 20 oz. each) was done by M/s Krishak Udyog Ltd. of Nagpur in 1948-49, but it was discontinued as it was not found paying due to high cost of raw material.

As the knowledge about the efficiency of different processing methods under Indian conditions is as yet poor, it is essential to improve not only the quality of processed products but also their methods of processing. With the rising standard of living, the urban population would prefer better class of processed stuff which could not possibly be made under the present condition.

A few factories for the preservation of goat meat by dehyderation were started as a war time measure in a few places in India like, Delhi, Amritsar, Poona, Madras, Patna, etc., under the aegis of the then Department of Food, Government of India, for supplies to the Defence Services. But with the cessation of hostilities, these factories closed down as there seemed to be little demand for dehyderated meat amongst the Indian consumers. The subject is fully discussed in Chapter III.

Before the World War II, a small quantity of sun-dried beef classed 'Biltong' was prepared in Delhi and Uttar Pradesh for export to Burma, but since then it has not yet been revived.

In many foreign countries, principally United Kingdom and United States of America meat is preserved in various ways. Canning is one of the most popular means of preservation that is extensively used in these countries, for both raw and cooked meats. Fresh beef, pork, veal, lamb and some of the offals are well adapted to canning. Delicious soup stocks are prepared and preserved in this way. Pork and lamb often are cooked down and sealed in fats for preservation.

The object of curing meat is to preserve it for future use, to add variety to the diet, and to avoid using all fresh meat. Common salt is the basis of all meat curing material and is the only absolutely necessary ingredient. It preserves, dries and hardens the tissues by deriving out the moisture and meat juices. It should be pure and clean to get the best results. Sugar adds in keeping the muscles soft and adds flavour. Salt peter may be added to give a red colour and it also has some preserving effect.

(3) FOR OTHER USES

It will thus be seen that almost all the meat produced in India, is used for cooking and table purposes for human consumption. Only a very small quantity goes for the consumption of zoo animals like, lions, tigers, leopards, etc. and for feline and canine tribes like cats, dogs, etc.

The utilisation of meat in a city or town is invariably higher than in the rural areas of the State in which the city is situated. The reasons for the higher consumption are shown to be (*i*) the proportionately larger *per capita* income of the town dwellers and (*ii*) the facilities available in cities for purchasing meat in small quantities and at all times. It would, however, appear that in some of the urban towns like Bombay, Calcutta and Madras, there is ~~a~~ marked deterioration noticeable in their meat supplies in recent years and no steps seem to have been taken to augment the supplies so far. There is no doubt that the population in the cities have increased considerably as compared with population in 1941. The *per capita* consumption that has somewhat fallen in these cities may also be attributed to the large concentration of refugees and migration of population from villages to cities without a corresponding increase in number of slaughter animals to meet the increased demand of meat.

This shift in the Indian population from rural to urban areas is clearly indicated in the provisional figures of population of 75 cities at the 1951 Census. These figures show that during the decade 1941–51, the population in these 75 cities has increased by 43.8 per cent compared to 13.8 per cent average increase for the whole country. The total population of these cities according to the 1951 Census is 24,085,169 compared to 16,748,552 in 1951.

Among the premier cities, New Delhi with a population of 279,063 shows the highest increase of 197.7 per cent. during the decade. Madras with 83.9 per cent. increase comes second, Bombay with 63.1 per cent. comes third, while Calcutta is fourth with an increase of 20.9 per cent. These trends, in fact, tend to increase further the urban demand for meat. This intake of meat, therefore, ought to be substantially increased many folds than the present woefully inadequate output.

H.—Per capita consumption of meat

It has already been stated that from a market standpoint the effective demand for meat is entirely urban in character, the rural demand for meat being relatively poor or small in the sense that there are not many purchasers of meat in the villages.

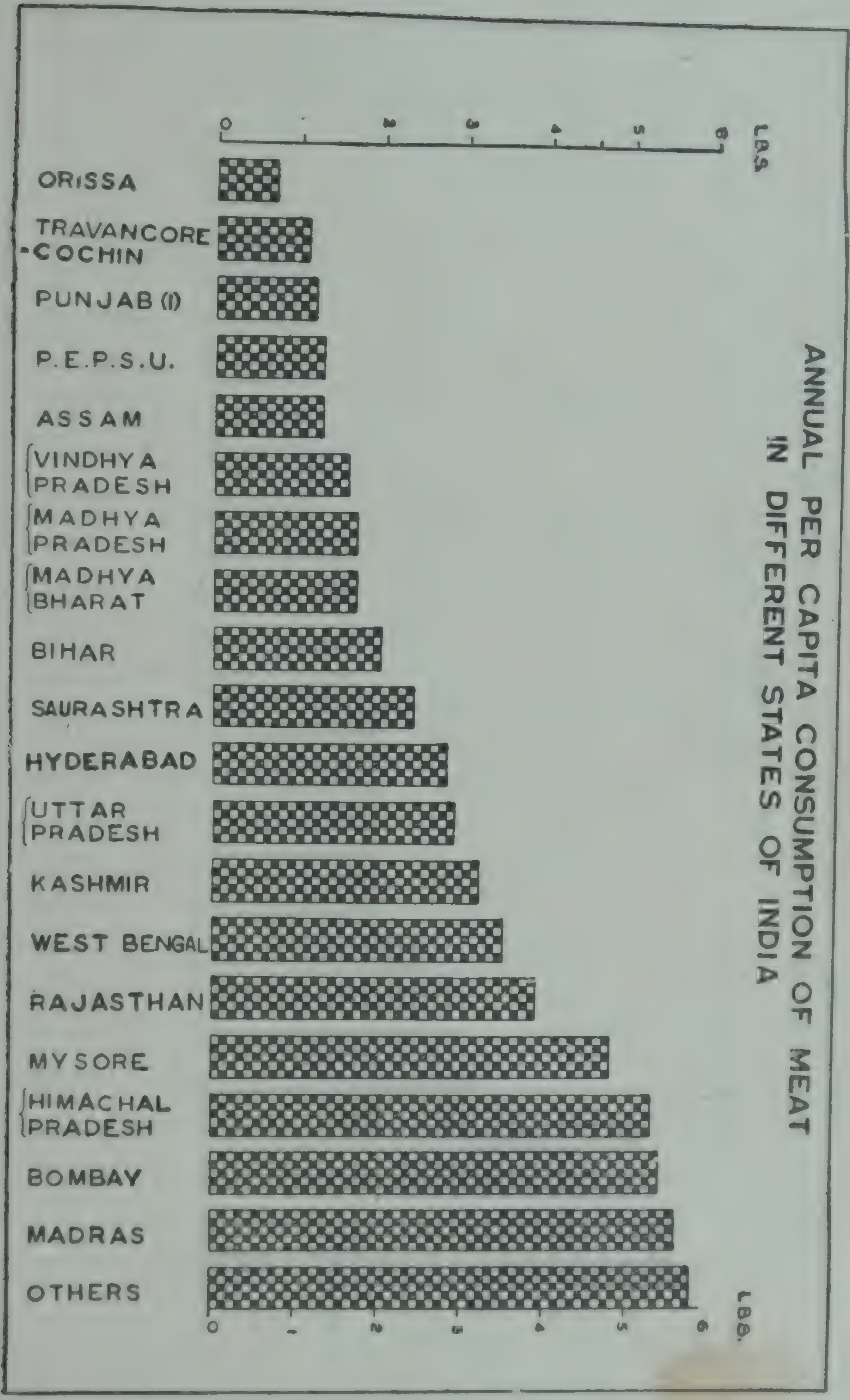
The urban demand for meat as measured by the *per capita* consumption in the cities and towns is dependent mainly on three factors, *viz.*, (*a*) the availability of meat, (*b*) the *per capita* income of people and (*c*) the price.

(*a*) *Availability of meat.*—Meat is largely produced in the urban areas, mostly on the outskirts. Being a highly perishable product, an efficient and suitable organisation is needed to bring it rapidly and regularly to the consumers in a wholesome and fresh condition. In India, facilities for rapid assembling, and transport under suitable conditions are not yet properly developed. There are practically no large organisations to handle meat in bulk for consumption in urban areas.

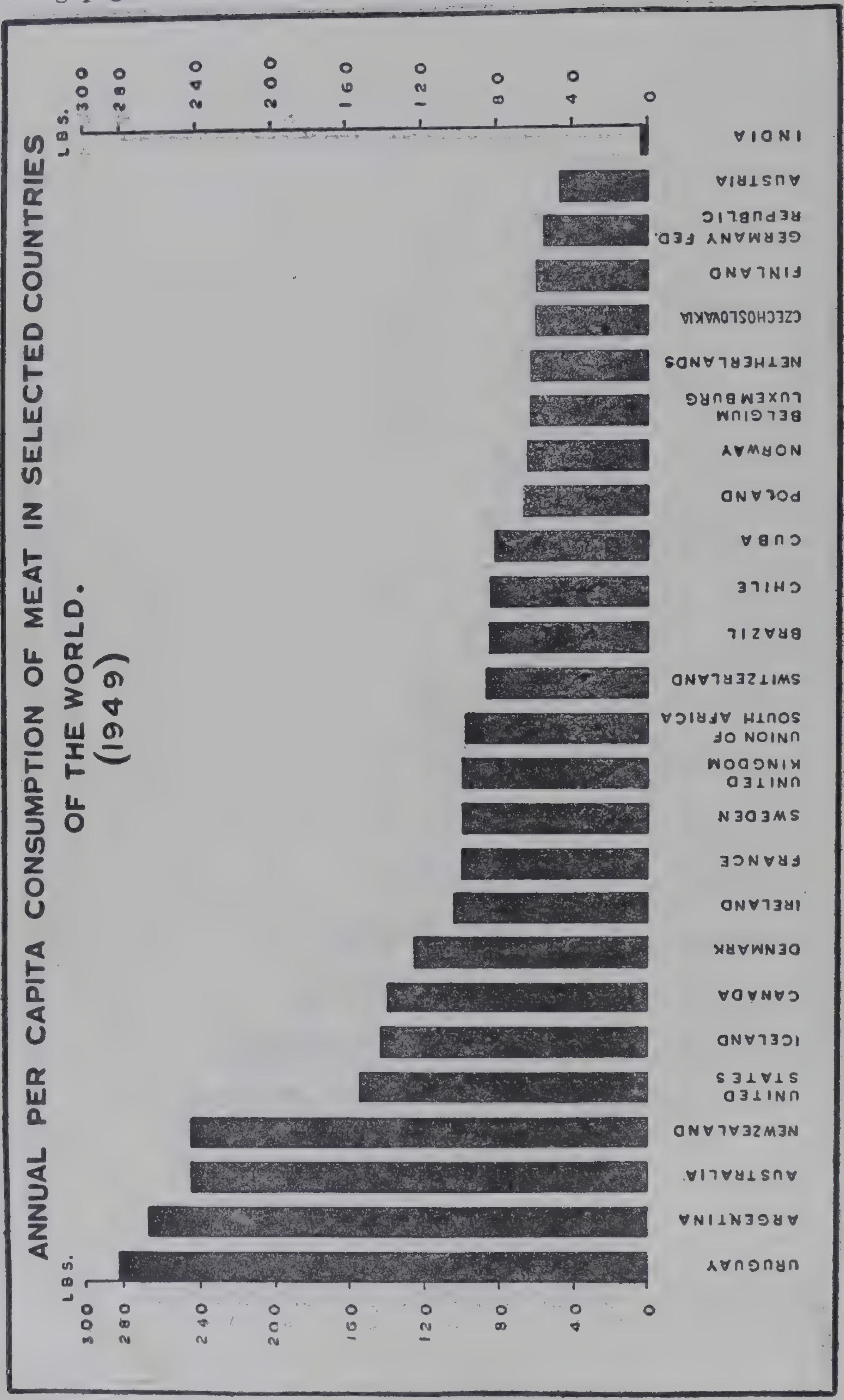
Scattered, individualistic and small scale production adds to the difficulties of assembling large supplies. On an average, a butcher slaughters only one or two animals in case of beef and few heads of sheep and goats in case of mutton and goat flesh. Such a position makes economic assembling of meat difficult and also unavoidably raises the consumers' price. This factor often limits the availability of cheap meat in sufficient quantity for consumption in towns and cities.

(*b*) *Per capita income of people.*—This is the most important factor which limits the *per capita* consumption of meat. It has been the experience in all countries that families having small incomes, consume the smallest quantity of meat and the consumption proportionately increases with rich and well-to-do families. Although comparative figures of family incomes and standards of living in different countries are not available, the average *per capita* income in India is notoriously small compared with many other countries, on which account, the Indian *per capita* consumption of meat is relatively very low. Owing to various calamities and long continued draughts in some parts of the country, the purchasing power of certain classes of the community in those areas has diminished considerably in recent years and, even when meat is available many have not the capacity to buy it.

(*c*) *Price.*—It is obvious that the factors of price and income go hand in hand, so far as the *per capita* consumption is concerned. Most of the families with low income can spare only a small sum to buy their requirements of meat. The price of meat is, therefore, the limiting factor with them. It will be seen later in the Chapter on 'Prices', that the price of meat in India is not different from that of some other countries and in some cases meat is even dearer in India although in western countries it is processed and delivered under more hygienic conditions. The fact is that with a low *per-capita* income, the Indian consumer has to purchase meat at a dearer price than a consumer abroad. This, to an extent, is responsible for a low rate of consumption of meat in India.



ANNUAL PER CAPITA CONSUMPTION OF MEAT IN DIFFERENT STATES OF INDIA



ANNUAL PER CAPITA CONSUMPTION OF MEAT IN SELECTED COUNTRIES OF THE WORLD. (1949)

Keeping in view the fact that an appreciable but as yet unestimated proportion of Indian population has conscientious objection to flesh food and further, while one class of people (Hindus) is forbidden to consume beef and buffalo flesh, the other class *viz.* (Muslims) is precluded from eating pork on religious grounds, it becomes rather difficult to arrive at any correct estimates regarding *per capita* consumption of meat. On account of these divergencies, as also widely differing meat yields, the *per capita* consumption is not uniform from region to region and from family to family in the same region. On the contrary there are rather sharp variations both in total *per capita* meat consumption and in the relative amounts to different kinds of meat used in the diet.

Taking into consideration all the different kinds of meat (beef, buffalo flesh, mutton, goat flesh and pork) produced in India, and the Indian Union population figures as per 1941 human Census (32 crores), the average annual *per capita* consumption of meat works out to 3.2 lb. which is considered to be very low as compared to many other countries. If the meat eating communities alone are taken into account, estimated at roughly 50 per cent of the total population though majority of them cannot afford to eat meat every day, the *per capita* consumption of meat works out to 6.5 lb. But if the tentative total figures of 1951 Census (36.1 crores) are considered, the *per capita* consumption gets further reduced and come to 2.9 lb. only.

The table below deals with the *per capita* consumption in the different States of India (*see* diagram facing page 50):—

TABLE No. XIX

Annual per capita *consumption of meat*

State 1	*per capita* consumption (lb). 2
Assam	1·3
Bihar	2·0
Bombay	5·4
Himachal Pradesh	5·3
Hyderabad	2·8
Kashmir	3·2
Madhya Bharat	1.7
Madhya Pradesh	1·7
Madras	5.6
Mysore	4·8

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TABLE No. XIX—*contd.*

1	2
Orissa	0·7
PEPSU	1·3
Punjab (1)	1·2
Rajasthan	3·9
Saurashtra	2·4
Travancore-Cochin	1·1
Uttar Pradesh	2·9
Vindhya Pradesh	1·6
West Bengal	3·5
Others*	5·8
Total	3·2

It will be seen that the maximum consumption *viz.*, 5.6 lb. is in Madras State followed by 5.4 lb. in Bombay and 5.3 lb. in Himachal Pradesh. Consumption in Orissa, is the lowest, being only 0.7 lb. per annum. Actual consumption *per capita* in different tracts tends to be very closely related to the indigenous supply, but varies widely from the all India average figures, as food habits of people, prevailing prices of meat, customs, religion and prejudice play a big part in determining the demands for meat.

So far the trend of *per capita* consumption of meat on an all-India basis is concerned, there is practically no data available to indicate the trend of Indian consumption. However, it is well known that the livestock population has not kept pace with the human population during the course of last 15/20 years. The concensus of opinion also seems to be that the meat yields of animals in the country have deteriorated and not improved during this period. It can, therefore, be safely assumed that the *per capita* consumption of meat in India is in consequence on the decrease.

It may be observed that most of the countries abroad, in recent years, have endeavoured to increase their production and consumption of meat. In some, the increase in output has far exceeded the growth in their population. To meet the new problems created by increased production, rigid government machinery for supervision has been set up in these countries, which has resulted in a higher standard of cleanliness and a greater assurance of safety in the quality of meat put on the market with the result that there is a noticeable increase visible in *per capita* consumption of meat in good many places.

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* Includes Ajmer, Bhopal, Bilaspur, Coorg, Delhi, Kutch, Manipur, Sikkim and Tripura.

The *per capita* consumption of meat in some of the selected countries of the world may be seen from the table below (*see* diagram facing page 51):—

TABLE NO. XX

Annual per capita *consumption of meat in selected countries of the world* (1949)

Continent and countries	*Per capita** consumption (lb.)	Continent and countries	*Per capita** consumption (lb.)
EUROPE		SOUTH AMERICA	
Austria	46	Argentina	266
Belgium-Luxemburg	62	Brazil	84
Czechoslovakia	59	Chile	84
Denmark	125	Colombia	64
Finland	59	Peru	51
France	99	Uruguay	282
Germany Fed. Republic	55	ASIA	
Greece	18	India	3·2
Iceland	143	Japan	2
Ireland	103	Phillipines	13
Italy	29	Turkey	..
Netherlands	62	AFRICA	
Norway	64	Algeria	18
Poland	66	Egypt	15
Sweden	99		
Switzerland	86	Union of South Africa	97
United Kingdom	99	OCEANEA	
Yugoslavia	37	Australia	244
NORTH & CENTRAL AMERICA		New Zealand	244
Canada	139		
Cuba	81		
Mexico	48		
United States	154		

Source.—F.A.O. commodity reports—Meat and livestock, 29th December 1950.

*Converted from Kilograms to lb. taking 2·2 lb. per kilogram.

Uruguay ranks first, with a total of 282 lb. meat *per capita*. Argentina second with 266 lb. Australia and New Zealand third with 244 lb. and United States fourth, with 154 lb. These countries produce large quantities of meat and are also the leading meat exporting nations. The lowest *per capita* consumption of any of the countries include in the table is Japan, with an average of about 2 lb., followed by India with 3.2 lb. This is because Japan is an essentially fish eating country. No figure indicating a universally desirable and applicable level of meat consumption can be suggested. Meat contains certain nutrients which are needed by human beings, *i.e.*, protein of good quality and certain vitamins. But since these requirements can be met by a variety of foods both of animal and vegetable origin, the availability of other foods and the nature of the diet as a whole must be taken into account in appraising the need for meat. It has been tentatively suggested by F.A.O.* that no less than 100 calories per person per day, and preferably 105—200 should be derived from meat (including poultry), fish and eggs. In India, far from attaining this level of consumption, it is very low as compared to some other foreign countries as shown in the above table. The reasons are not far to seek. Abject poverty of the masses and low average *per capita* income do not provide any means of purchasing power to the poor with the result that meat is still considered to be a luxury that a few can afford to indulge in.

In United States, the American Meat Institute, which is a trade, research and educational association of the meat packing industry, spends large sums annually on 'consumer's education and makes sustained efforts to drive home continuously to their clients the value of meat and its products. An outstanding example of such service, is in the judicious use of advertising which has increased the consumption of meat over many other foodstuffs.

Thus, for India as a whole, the prospect of increasing the consumption of meat is linked closely with the rate of progress that will be made in improving standards of living. In backward areas, present standards do not permit the consumption of significant quantities of meat, even if physical conditions would permit an expansion of production in these areas. In other regions, even the most progressive, there is a potential demand for meat specially mutton and goat flesh which is far beyond present consumption levels. In any case it appears that India should be able to raise *per capita* consumption substantially. Total Indian production of meat in 1949 is roughly estimated at about 461 thousand tons. This volume would have to be increased many folds in order to keep abreast with the increasing population expansion in the country.

1.—Dietary requirements

The prosperity of a nation is judged by the standard of living and health of its people which in turn are dependent upon adequate availability of well balanced human diet including foods of animal origin.

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*F.A.O. Commodity series No. 12, May, 1949.

To maintain proper health, the human body must have not only a sufficient quantity of food (measured in terms of calories) but also variety of nutritive elements, constituting what is called a balanced diet. What constitutes a balanced diet, depends on many factors: climate, nature of work, age, physique, etc. Even where the total quantity of food is adequate, an unbalanced diet will cause stunted growth, weakness and susceptibility to disease. The food values of some of the livestock products are shown in Appendix No. X.

It will be seen that meat is a food of high nutritive value, containing, as it does, certain vitamins and mineral salts. Its protein contents nearly equals that of fish and it takes an important place amongst the protective articles of food. The protective food like meat, fish, etc. are meant to supplement, not supplant a rice diet. This is necessary first because there is insufficient rice to go round, and secondly an exclusive rice diet is deficient in several nutrients.

The Indian Research Fund Association, now Indian Council of Medical Research has made several studies, on Indian diets in recent years. The composition of a balanced diet, recommended by the Nutritive Advisory Committee of the said association, as being adequate for the maintenance of an average adult in good health in India, per day is as under. In doing this the Committee had taken into consideration the current dietary particulars and had aimed at formulating a diet in which optimum health was possible.

Composition of a balanced diet

	Oz. per day
Cereals	14·0
Pulses	3·0
Vegetables	10·0
Milk	10·0
Fruits	3·0
Sugar & Jaggary	2·0
Fat (Ghee, oil, etc.)	2·0
Meat and Fish	3·0
Eggs	1 egg.

The above analysis clearly shows that 3 oz. of meat and fish a day per head is the minimum that is needed for ensuring a reasonable health and mental wellbeing of an adult in this country. Assuming that one-third of this consumption will be meat, the total annual requirement of meat would work out to be 32.6 lakh tons, as against the present production of 4.6 lakh tons.

Obviously a satisfactory solution of the problem of animal nutrition is an essential pre-requisite to the complex problem of human nutrition. The nutritional requirements of man cannot be met only from the agricultural produce, but such foods as meat, milk and eggs, which directly originate in animal and are indispensable. The problem of maintaining the efficiency of animals by proper nutrition is, therefore, of paramount importance, as this will ultimately be reflected in the increased supply of good quality foodstuffs required by man.

The Famine Enquiry Commission in the Chapter on " The Problem of Nutrition ", in their report (1945) while discussion the extent to which the population in India suffers under—and mal-nutrition observe : " A large proportion of the population consumes a diet which the population in India suffers from under—and mal-nutrition workers, *i.e.,* which does not contain protective foods in sufficient amounts. Among the poor section of the community both urban and rural, there is much under-nutrition as well as mal-nutrition". In another place the commission in its report says, " The inadequacy of the present consumption of protective foods can be illustrated by quoting an estimate made by the Indian Council of Agricultural Research of the percentage increase in the production of various (protective) foods required to provide suitably balanced diet in minimum quantity for the 400 million people of India; Pulses by 20 per cent, vegetables by 100 per cent, milk by 300 per cent, fish meat and eggs by 300 per cent*".

Thus, the necessity for augmenting the supply of vital supplementary or subsidiary food, like meat to ensure a balance diet to an average adult in India is now more important than ever before. Happily, there is not the same prejudice against meat eating, particularly mutton and goat flesh, as existed before. Progress demands that we do not allow any sentiment to stand in the way of improved food supplies and we rapidly shed our prejudices if any against meat eating in this country.

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* Quoted from Memorandum on the Development of Agriculture and Animal Husbandry in India by I.C.A.R. (1944).

CHAPTER II—PRICES

General

Prices of meat tend to vary inversely with marketing of food animals. That is, prices are relatively high when the number marketed is small, and prices are low when marketings are relatively high. The World War II has brought in its wake inflation and prices of all food articles and consumer goods have increased considerably in India. Meat prices, generally speaking, have been gradually increasing since 1940, in sympathy with the rise in the cost of living index, and during 1950 remained in the neighbourhood of about 300 per cent. of the prices ruling in 1940. The demand for meat is also concentrated in towns and cities with the result that prices are always higher by a few annas per pound in these places than the prices prevailing in the rural areas.

Unfortunately, price data is not easily available because the trade is in the hands of persons, who, as a rule, do not maintain any price record and in a few cases where accounts are maintained, it is difficult to trace the trend of prices backward for more than a year or two. Comparison of prices is also rendered rather difficult by complexities due to variations in type, quality, cuts and joints etc. etc. Information contained in official gazettes, wherever published, is also wanting in this respect. The difficulties in collecting price data from the trade in general will, therefore, be appreciated. In the absence of proper data on prices it is difficult to study the trend, seasonal variations and difference in price of meat of different types in a number of markets. However, every effort has been made to collect and review the matter as fully as possible but the prices given should be taken to be applicable to average market qualities only which in actual practice, are all sold mixed together at a flat rate.

The abnormal demand created by the war resulted in a progressive increase in the prices of meat and its by-products. Consequently the quantity instead of quality being the foremost need of the moment, price indices attained high levels irrespective of any consideration of the very factors the presence or absence of which in normal times determines the meat prices.

Meat prices in most states were under some form of Government Control during the later part of the war, although the level at which they were established was generally higher than the pre-war level.

A.—Units of sale for wholesale and retail business

Meat is commonly sold on the basis of weight both in urban and rural areas and the price is invariably quoted per lb. or seer. The production and consumption of meat, being both small and individualistic, it is only natural that it should be sold in retail mostly. Wholesale transactions in meat are ordinarily not noticed. In some cases where wholesale business does take place, such as supplies intended for ships, hotels, messes, hospitals etc., the unit of sale is either a maund or hundred lb. Occasionally, wholesale transactions take place also on the basis of whole or entire carcase. The weight of the carcase is mentally estimated and the price offered includes a margin of 15 to 20 per cent. to cover the slaughtering, dressing and other incidental charges, as also a small profit for the seller. Sometimes a half, side each, or whole price of the front portion including ribs, cervical region and fore limbs and whole half piece of the hind portion including hind legs, lumber and coccygeal region of beef or buffalo carcase forms the unit of quotation.

In urban area, the unit of sale varies according to the type of meat. Mutton and goat flesh is sold at so much price per seer, whereas for beef and buffalo flesh the price is quoted per seer and also per lb. Pork is always quoted per lb. in retail sales.

In rural areas, the unit of sale is usually one seer for meat of all types except for internal organs and head and legs, and also when the animals are slaughtered and divided by a group of persons in which case meat produced from an animal is divided into a number of heaps of equal quantity according to the number of persons to be shared. In this case the weight of such heaps varies from 2 to 3 lb. according to the number of persons amongst whom the meat has to be divided. This is a fairly common practice in many villages. In a few centres, both in urban and rural areas, as in Bihar, meat is offered for sale in small lots or heaps called *"dara"* or *"pashari"* (panseri)—generally a 5 seer unit. The meat is brought for retail distribution at 'hats', or by hawking and ordinarily purchases by each hawker-butcher do not exceed 2 to 6 *'daras'* at a time. The sale of such meat is mostly confined to a radius of 2 to 8 miles from place of origin.

As regards offals, the unit of sale varies to some extent from place to place. Generally, the edible offals of cattle and buffaloes are cut into small bits, (*i.e.*, a bit of stomach, intestines, liver, lungs, spleen, etc.) and sold in about 1 lb. heap. In some urban places like Bombay, Calcutta, Bangalore etc. where there is demand for liver, heart, tongue etc., they are sold separately, price being quoted per piece. Selling of liver on weight and quoting the price per lb. is also not uncommon.

In case of sheep and goats, the lung group including trachea heart and liver forms a unit of quotation. In some places liver is sold separately. Head alone or head and four legs are taken as a unit of sale. Other offals generally sell by piece but in certain places, the whole lot excluding lung and liver group is sold at one price.

The offal of pigs do not generally find demand except the liver which is sold on round basis. Guts are used for sausage filling.

Brain, kidneys and testicles are removed and sold separately. The former is sold per piece, while the latter either per piece or by weight.

The common units of sale at meat markets are the seer, viss and pound, and their multiples. Of all the three, seer is most prevalent and it has different definitions as different localities. The variations in weight of a seer are tolas 24, 40, 80, 84, 88 and 96, so far meat sales are concerned. For example, a seer means 24 tolas in South Arcot and Tanjore districts; 80 tolas in Anantapur district and 96 tolas in Bellary district in the State of Madras. There is also variation in the weight of seer at one and the same locality when it is adopted for weighing different commodities.

It may also be stated that in good many places, particularly in rural areas, standard weights are not in use. More often than not, stones of different sizes, in many cases, worn out a good deal, are used as equivalents to standard weights for weighing purposes. The consumers, thinking that these stone-weights may be short, always reasonably or unreasonably demand extra piece or two of meat from the butchers, which the latter have to give with a view to keeping their clients pleased. This practice is so widely prevalent that the butchers do not feel the necessity of keeping correct weights.

It is evident from the foregoing that in quoting the prices, the trade does not follow a uniform method and a good deal of variation exists in the units of sale and they differ widely from State to State. In some places, meat is quoted per seer or lb. and in others the price is quoted in rupees per lb. These diversities are certainly not helpful and it would be better if the basis of quotation were standardised. The disadvantages to which both producers and consumers are put to by the use of weights of varying denominations are too well known.

It is, therefore, recommended that the various municipalities should take steps to introduce the system of quoting the price of meat on the basis of weight, *i.e.*, per lb. or seer, for each kind of meat. This would render the comparison of prices in different market easier and a system or price intelligence could be built up to the advantage of the meat trade.

B.—Factors affecting prices

The most essential properties of meat which go to determine its value and safety for human nutrition, its marketable quality and its suitability for conversion into other edible products are (*i*) normal chemical composition, (*ii*) freedom from physical impurities, (*iii*) bacteriological cleanliness and fair keeping quality, and (*iv*) safety or freedom from disease producing organisms. The other factors which determine or influence the price of meat are :—

(*i*) The type of flesh, *e.g.*, beef, buffalo flesh, mutton, goat flesh, pork, ham or bacon.

(*ii*) Quality of flesh *i.e.*, from young, mature, or old animals, castrated or uncastrated animals and fattened or lean and emaciated animals.

(*iii*) Freshness as denoted by colour, smell, touch, etc.

(*iv*) Cuts and Joints.

(*v*) Locality.

(*vi*) Season.

(*vii*) Famine, floods, epizootics etc.

(1) TYPE OF FLESH

The price varies to some extent according to type of flesh as the price of beef or buffalo flesh is about 50 per cent. lower than mutton, goat flesh or pork. There is not much difference between mutton, goat flesh and pork as these types generally fetch a uniform price except for slightly higher price for pork in some places.

In the marketing of meat, beef and buffalo flesh generally go together, there being hardly any difference in prices between the two, though in some places buffalo flesh sells slightly cheaper than beef. Compared to beef, buffalo flesh is tough but the public can seldom distinguish one from the other with the result that buffalo flesh is easily passed off as beef. The prices of beef, including buffalo flesh are invariably lower than the prices of mutton and goat flesh, because of the relatively small demand for this type of flesh. There is another reason which accounts for the cheap price of the beef. Old and emaciated animals are often slaughtered for their hides rather than for their flesh which is to be disposed of more as a by-product. The normal price of beef (1950) is 7 to 9 annas per lb. or about 50 per cent. that of mutton.

Mutton and goat flesh are generally grouped into one category in the meat markets much the same way as beef and buffalo flesh. though in many places mutton and goat flesh is sold also separately. Mutton, on account of its being tender and rich in fats, fetches slighter higher price than goat flesh in some places particularly Cantonments and predominantly Muslim areas as also in some urban markets specially where there is concentration of Anglo-Indian and European population. The bulk of the meat eating population in India, however, prefer to eat goat flesh mainly because of its relatively easy digestibility, on which account goat flesh fetches better price than mutton at most of the other urban markets. Otherwise the prices of mutton and goat flesh dc not originally differ from each other to any appreciable extent. As these two types of meat are in great demand all over India, they command comparatively a higher price, the range being -/12/- to Re. 1 or even more per lb.

There are three classes of pork—fresh, pickled or processed and smoked. Fresh shoulders, sides and hams are either sold for current consumption or wholesaled for immediate curing or smoking. Pork makes fine eating but religious scruples prevent many people. particularly Muslims from partaking this type of meat. Pork is ordinarily available in towns only and the demand is confined mostly to Europeans, Christians and a few westernised Indians. Moreover, as pigs are not available locally in most of the towns and have to be imported from outside for slaughter, naturally pork sells dearer than many other types of meat, the average rate being -/14/- to Re. 1 per lb. Ham and bacon being cured and processed products, sell even at much higher prices than fresh pork, roughly at Rs. 2/8/- to Rs. 3 per lb.

Table XXI given below shows the variations in the prices of different types of flesh at a few selected centres :

TABLE No. XXI.

Prices of different types of meat at certain centres

(per lb.)

Type of meat	Centres							
	Bombay		Madras		Calcutta		Delhi	
	1948-49	1949-50	1948-49	1949-50	1948-49	1949-50	1948-49	1949-50
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Beef	0 11 0	0 10 9	0 9 0	0 9 0	0 10 9	0 11 0	Not sold	
Buffalo flesh ..	0 9 10	0 10 9	0 8 0	0 8 0	0 10 0	0 10 0	..	..
Mutton ..	1 3 9	1 3 9	1 5 9	1 4 0	1 6 0	1 6 0	0 14 0	0 14 0
Goat flesh ..	1 3 0	1 3 0	1 5 9	1 4 0	1 4 0	1 5 0	0 14 0	0 14 0
Pork	1 4 0	1 3 9	1 0 0	1 0 0	0 14 0	0 12 3	0 14 0	0 14 0

(2) QUALITY OF FLESH

The prices of meat to certain extent depend on the quality of flesh sold. The factors which determine the quality of a carcase are (*a*) palatability in so far as that can be determined by external indications, (*b*) conformation and (*c*) finish or degree of fat.

First and foremost, people eat meat because they like it. Palatability is influenced by the tenderness, juiceness and flavour of the fat and flesh. The term refers to the effect of the flesh, fat and meat juices when cooked, on the normal plate. It includes both tenderness and flavour. It can be judged to a large extent by certain visible characteristics, such as the condition of the bone, the colour of the flesh and the texture of the meat. It is closely linked with and dependent on conformation and finish. Flesh from young and mature stock is considered to be better in taste than from old and emaciated ones and fetches higher price than the latter.

The quality further depends on the condition, conformation and health of the animal from which meat is obtained, *i.e.*, young, mature, old, lean, fattened, etc. The flesh of very young animals is very soft and watery and so their meat is not relished. Small lambs and kids as well as young calves below 6 months are, therefore, not allowed to be slaughtered at certain slaughter houses. Sheep, goats and pigs between 6 months and one year and cattle between 1 and 3 years produce best meat. Very fine meat is obtained from castrated and fattened animals, whereas lean and tough meat is yielded by old and emaciated animals. Flesh of a fatty animal of any type, therefore commands a higher price over that of lean.

A considerable amount of the mutton produced in this country is from ewes. While the range of ewe mutton is wide, vaying from prime and young ewes to the aged ones that are past breeding, a considerable quantity of it is of a very fair standard of quality. The meat from ewes varies largely according to the age at which they are killed. The meat of young ewes that have had, say, one crop of lambs, while somewhat darker in the flesh than that of yearling sheep, and while the bones show the opaqueness characteristic of age, is of good eating quality when well finished. The flesh of older ewes tends to become rather dark, coarse and less palatable.

Price differences on qualitative considerations are seldom noticed in the rural areas. In the important municipal and other urban areas, beef, mutton and goat flesh are generally divided into two classes apparently on the basis of quality, but strictly speaking such classification is made on the basis of fact contents and external appearance only. Meat from old and emaciated animals is generally put under the second class whereas that from young, castrated and healthy animals is classified as first class meat. There is also an impression in some places that meat obtained from middle aged female sterile animals is quite delicious and as such it is considered to be of superior quality. Normally a difference of a few annas, say 2 to 4 annas per lb. is noticed between one class and another. Size and weight are some of the considerations which sometimes affect the price in relation to quality. Majority of the meat eating population in this country prefer to have meat of smaller animals than the big ones. The ideal weight for a well finished lamb or kid carcase is approximately 8 to 10 lb.; for a mutton or goat flesh carcase not above 15 to 20 lb. Many connoisseurs prefer even smaller weights in lambs and kids and their flesh called *'Hulvan'* is very much relished. Smaller the kid the better and fancy prices are sometimes offered for such a type of flesh.

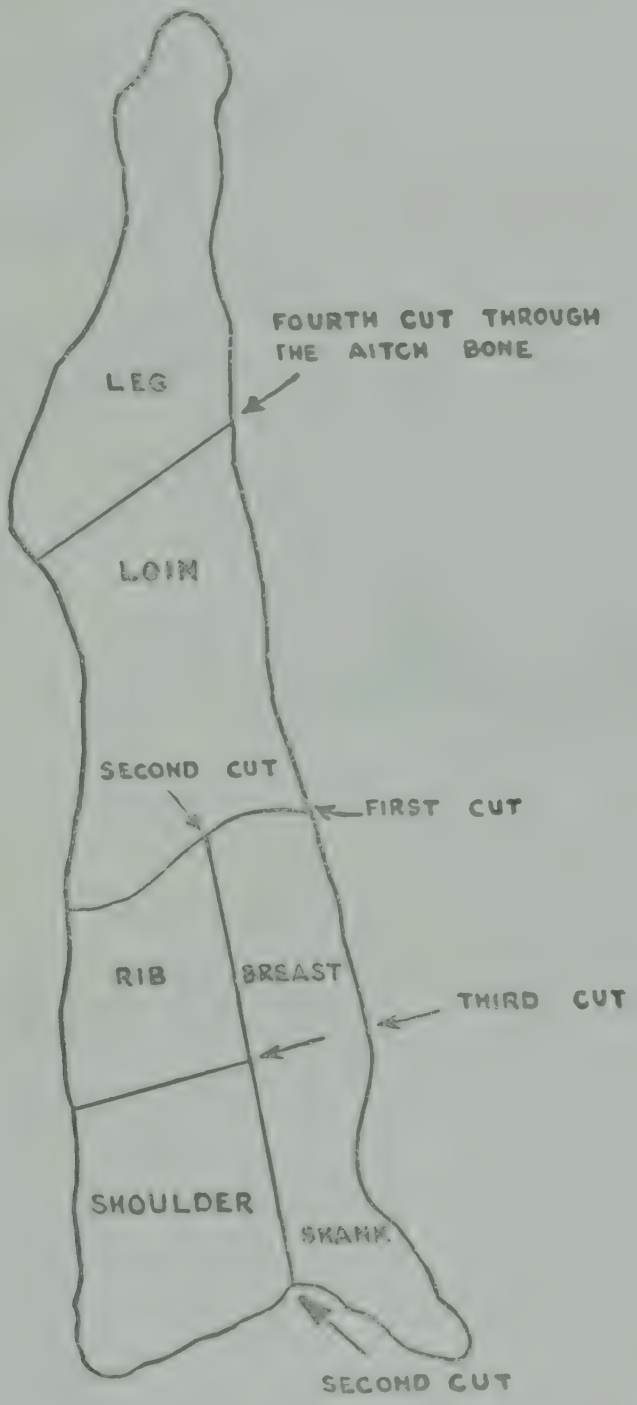
In the rural areas, however, no such distinction is observed and meat or flesh etc. obtained from animals of different age and group are sold at a flat rate determined by the butchers.

(3) FRESHNESS

Meat which is absolutely fresh, fetches for obvious reasons a better price than another which is stale. In all meat, freshness is denoted by colour and it is an important factor in determination of prices. Fresh meat should be of a lightish pink hue, not too red and not too slaty. The meat should be firm and fine in grain, not coarse or stringy. It should have a smooth velvety touch and should be full of sap. The fat should be well distributed.

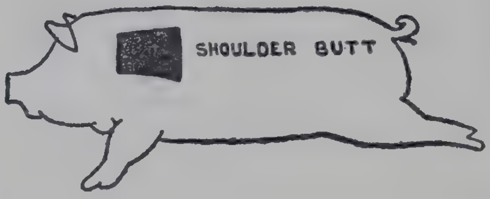
The general attractiveness is thus an important factor in selling meats. The selling of fresh meat is a common practice met with everywhere, all over India, since the hot climate prevailing in the country does not permit of keeping the meat long. In almost all centres animals are slaughtered in the early hours of the morning and dealers in meat make every effort to sell away the whole stuff during the course of the day mostly before noon. Customers who

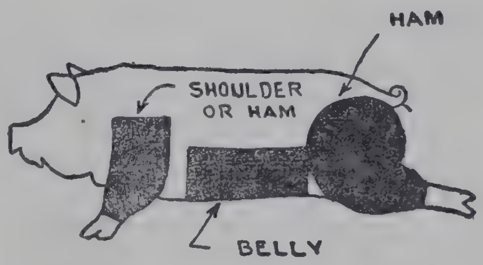
WHOLESALE CUTS OF BEEF

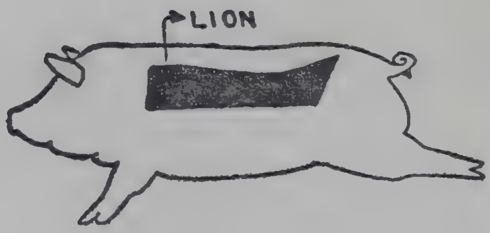

FOURTH CUT THROUGH THE AITCH BONE
LEG
LOIN
SECOND CUT
FIRST CUT
RIB
BREAST
THIRD CUT
SHOULDER
SHANK
SECOND CUT

Facing page 63]

CUTS OF PIG CARCASE


SHOULDER BUTT


HAM
SHOULDER OR HAM
BELLY



wish to have the best portions have to come early, for there is no such thing as reserving choice cuts for any one. Those who come late have to take what is left. Meat which is left unsold in the day of slaughter in places where there is no arrangement for keeping over night is disposed of at a lower price by 2 to 4 annas per seer on the following day.

The meat loses its colour and flavour to some extent under ordinary conditions of storage even for a few hours and as such it sells at a discount. It is observed that the meat sold in the evening loses in value to the extent of 20 to 30 per cent. Stale meat in advanced stage can easily be detected by its bluish tinge and its putrid and disagreeable smell and a sort of burnt up appearance on the surface.

(4) CUTS AND JOINTS

After the carcase is divided into sides and quarters, it is further sub-divided into recognised portions known as cuts. The bigger cuts generally (cut) made at the points of articulation are known as joints. The stories surrounding the name of some of the meat cuts are rather fascinating. For example, according to an old English legend which dates back many years, King Charles II was so impressed with a platter of beef that was served at one of his feasts that he ceremoniously arose, touched his sword to the steaming platter and said "A noble joint, it shall have a little. Lion, I dub thee Knight—henceforth thou shall be Sirloin". The principal beef cuts recognised in important centres like Bombay, Calcutta, Madras, etc. are (1) shoulder, (2) shank, (3) sirloin, (4) rump, (5) round (thigh) (6) brisket etc. Different cuts are used for different purposes *i.e.*, round and brisket for boiling; sirloin, ribs etc. for roasting, rumps and flank for grilling and others for stewing purposes.

In case of sheep and goat carcase, the same are generally divided into their primal parts and into small edible portions mostly for use in curry, though there is also demand for cuts like saddle, shoulder, leg, breast, etc. etc. A hog or pig carcase is divided into 5 main wholesale cuts *viz.*, (1) head, (2) shoulder (3) loin, (4) belly, and (5) ham. Most purchasers prefer to buy cuts of meat that are of a proper size to meet the needs of their respective families, though hotel and restaurant keepers still prefer to go in for heavy joints from big size sheep and goats.

Different consumers have different preferences for different cuts and joints and accordingly they fetch better price in a market. Meat obtained from the thigh and neck portion of an animal is considered not only tender but also tasteful as compared to that obtained from other parts of the body. Some people who insist on taking exclusively these cuts have to pay extra prices. The premium so obtained is some times as much as 10 per cent over the average quality of meat, excepting in undercut in beef which commands as much as double the ordinary prevailing rate of beef. The consumer, though fully aware that he is being charged a higher price, is yet invariably satisfied because he is getting precisely what is ordered with a minimum of waste.

The consumers in the rural areas seldom make any differentiation between these cuts and hardly pay any higher price for them.

(5) LOCALITY

The price of meat varies to some extent from locality to locality and in some cases fairly appreciably even from market to market in the same locality depending largely upon the demand for meat, the economic position of the consumers and the quality of the meat offered for sale. For example, in Bombay town proper, the meat prices in the Crawford Market are comparatively higher than those ruling in Parel and Dadar markets, which are inhabited by labour and comparatively poor class people. It is observed that in an area the prices of the five types of meat differ from one another, but the extent of the variation is not the same in all tracts.

Generally, the demand in bigger towns and cities is more intense than in smaller towns. Bombay, Calcutta, Madras, Delhi, etc. are the premier cities of the States in which large markets are situated. They are important civil and military stations, as also commercial and industrial centres and possess a large number of hotels and restaurants. The purchasing power and standard of living of the people is high. Consequently, the price of meat in cities and towns is usually higher than in the small towns and villages. The other reasons for high prices are that better class of animals are slaughtered and there are higher expenses by way of transportation, rent and other incidental charges. It is, however, not known whether the premium in price which the urban butchers get, covers the extra cost involved in paying high stall rents, licence and market fees, more expensive labour charges. Unfortunately, no study on comparative costs of production of meat under different conditions has been made in this country to answer the above point. But a preliminary examination shows that the cost of production in the rural areas is definitely less and meat could be sold cheaper than that produced in the cities.

The high prevailing prices at one locality may also be due to the temporary shortage of food animals in that particular locality. Then again prices of certain specific types of meat may be higher in areas where there may be concentration of population preferring such types of meat. Thus mutton and pork prices have been found to be higher in areas where there are concentration of Anglo-Indian and European communities. On the other hand in localities where mutton is not preferred to goat flesh the former sells either at the same rate or cheaper as the case may be. The source of district of origin *i.e.*, the place from where sheep, goats or cattle are imported have sometimes some bearing on the prices of meat. An animal from hilly side where plenty of grazing etc. is available, is preferred because of the tender and finer quality of meat obtained from such an animal.

(6) SEASON

There is no particular season for meat, and as such the prices of meat are not generally affected by the change of seasons. No doubt, the demand for meat varies to certain extent in different seasons such as summer and winter, still there is hardly any fluctuations in prices of meat, because of the natural adjustment that is made in the number of animals slaughtered by the butchers. The prices on this account, more or less, continue to remain stationary, until otherwise affected by some sudden demand on festivals, such as Christmas and Bakri-Id; during Bakri-Id large number of animals are slaughtered for "*Qurbani*" (sacrifice). On these festivals specially well fattened animals which are highly prized are slaughtered and meat sold at a higher price than usual and sometimes even at fancy price.

The price of meat in some cases also depends upon the part of the day, *viz.*, morning or evening, at which it is needed most. In some places, the demand is more intense in the morning than in the evening and *vice versa*. Higher prices are, therefore, paid when larger quantities are in demand. If cold storage facilities were available cheaply raw meat at such places could be stored during the day or over-night as the case may be in order to stabilise the prices and obtain a better return for the butchers.

(7) OTHER FACTORS

Famines, floods, and epizootics, etc. are some of the other factors which may affect the meat prices in various ways. In times of famine, the producers and cultivators are unable to maintain their cattle and other livestock due to scarcity of fodder and are, therefore, obliged to sell them at cheap rates. The prices of cattle on such occasions fall as low as Rs. 15 to Rs. 20 per head. Such animals are generally purchased by the butchers for slaughter purposes. Similar conditions prevail in flood stricken areas. On the termination of the effects of a famine or flood, prices of food animals show a marked rise owing to an increased demand and poorer supplies. This in turn is reflected in the higher meat prices.

Many epizootic diseases such as anthrax, hamorragic scepticema, rinderpest, etc., etc., sweep away lakhs of cattle, etc., in India, every year. In areas where these diseases take an epizootic form, there is huge loss of animals and this abnormally depleted supply greatly increases the price of food animals which mean higher meat prices.

Sometimes prohibitive export taxes or embargos imposed on the export of animals from one territory to the other have an adverse effect on the prices. For example, during the last war, the taxes were raised in Chittor and Marwar in Rajasthan from Re. 1 to Rs. 7 and in Bikaner from annas 4 to Rs. 4 per animal with the result that the prices of meat in the surrounding areas were greatly affected.

There is one more factor which has sometimes great influence on the prices of meat, namely, demand and increase in the prices of hides and skins. When the prices of hides and skins are high, the prices of beef and mutton are low, and *vice versa* when the prices of hides and skins are low.

The meat prices sometimes also tend to go up in sympathy with other commodities as was seen during the last World War II when they reached the high level of Rs. 2 per seer of goat flesh and mutton in some places.

C.—Pricing of retail meat

The retail meat business differs from other lines of retailing in that much of the goods handled must be divided by the retailer into smaller units before being sold to consumers, and the different units thus obtained are sometimes sold at somewhat different prices, because of differences in the demand for them. In other words, the various retail cuts obtained from different food animal carcases do not sell at the same price per pound because of differences in the relative demand for various cuts due to difference in quality or suitability for consumer's use. The shrinkage and wastage resulting from the cutting, trimming and handling must also be taken into account and this makes the pricing process all the more complicated.

The spread between the lower price cuts and the higher price cuts is somewhat wider in the large cities than in the meat markets in many rural areas, though in most of the markets it is not uncommon for many of the cuts of meat to sell at more or less the same price per pound. Compared with meat which is procuced and sold in the rural areas, town-killed supplies are, in general, handicapped by the costs of transportation and other high operative charges such as rent, wages, general living expenses etc. etc.

Price fixation of meats, thus, demands an accurate knowledge of the production costs as also other incidental expenses. In many foreign countries, a number of cutting tests have been conducted to determine the approximate yields of the various retail cuts obtained from beef, mutton and pork carcases. Numerous price studies to ascertain the usual relationships between the prices of the different cuts from a carcase have also been made. Unfortunately nothing of that sort, has been done in this country. In fact there is no system of guaranteed prices, nor is there any exhaustive periodical bulletin giving publicity to the current economic position, as an aid to the fixation of prices. Prices for livestock and meat are not controlled, with the result that the producer gets very little margin of profit for his produce (livestock) and the butcher makes the best of the business by exploiting the consumer. The proper pricing of meet, therefore, though difficult, is yet extremely important. Some of the other factors which have to be taken into consideration while formulating a price policy for meat and meat-products are:—

(*a*) the production needs to be expanded considerably to meet the nutritional demand of the population;

(*b*) prices at which meat or products can be made available to a large section of consumers are normally beyond their means; and

(*c*) Meat and meat-products are perishable; the lack of suitable facilities for transport results in the localisation of the markets.

A price policy when formulated, should be such as would provide incentive to the producer to increase his production. Further by providing necessary and modern facilities for processing, transport and distribution, cutting unnecessary items of expenditure, etc. the meat and meat-products should be made cheaper to the consumer. The implementation of these suggestions will call for improvements in the organisation of the production and marketing of meat and its products, outlined in the last Chapter under the heading "Meat Plan". The organisation envisaged in the Meat Plan should concern itself both with the problem of improving marketing and distribution through the establishment of cold storage, processing plants and refrigerated transport. The organisation should have attached to itself impartial price fixing board which should take into account all interests concerned and determine fair prices.

Further, to enable producers to carry out permanent improvements and raise production over a long period, they should be assured that the Government would take steps to ensure that prices are not allowed to fall below certain minimum levels. What these levels should be from time to time will depend on such factors as the general level of prices, costs of rearing etc.

D.—Trend of prices

As already mentioned the butchers and others engaged in the trade, being mostly illiterate, do not maintain any records of prices for different types of meat. So far as rural areas are concerned, no statistics whatsoever, are available. It is, therefore, difficult to show an accurate trend of prices as data for many States are either very unreliable or wholly lacking. The recorded figures in Government Gazettes and after publications merely give a general indication of the price ranges, *e.g.*, 10 annas to 14 annas per lb. Prices are often governed by so many variable factors that a strict comparison is not always possible.

However, enquiries made from the experienced butchers in the important meat markets go to show that the prices of meat in important cities, civil and military stations and commercial centres have risen considerably during the last 12 years. In 1938, the average price ruling in India, for beef, mutton and pork was roughly 2½, 5 and 5 annas per lb. respectively. With the outbreak of war and in its first year, there was nominal rise in prices. In 1941, prices were higher roughly by 33 per cent. than the pre-war rates. Thereafter, a distinct gradual upward trend has been noticed. Prices went up by 40 to 70 per cent. in 1942, due to increased military demand and in sympathy with the rise in prices of other commodities. In 1943 and 1944, there was a steep rise due to heavy demand from military and prices were recorded at 6, 10 and 10 annas per lb. for beef, mutton and pork, respectively, which means the prices were higher by roughly 115 per cent. than the pre-war rates, the advance being particularly spectacular at the port towns, where prices more than doubled on all kinds of meat, due to heavy military concentration. The supply of meat in Calcutta was further reduced due to severe famine in Bengal and the restrictions imposed on the export of food animals by the neighbouring States. The prices continued to show upward tendency and in the beginning of 1945, new levels were touched at 195, 160 and 117 per cent. in case of beef, mutton and pork respectively. The high ruling prices led to relatively increased slaughter of cattle, and Government action was taken in 1944 to restrict the slaughter of the better grades and certain categories of cattle, sheep and goats.

Meat prices in most States were also under some form of Governmental Control during the closing months of the war and this exercised a healthy check on the inflationary tendency. After the war had ended, most of the States abolished or relaxed controls. In post-war period the prices of meat have tendered to go up still higher mainly because of the limited supplies of food animals and unstable conditions in the country as a result of the partition and subsequent concentration of population in urban areas. The prices ruling in 1950 stood roughly at more than three times of those in 1938.

The table below summarises the trend in prices of different kinds of meat at a few selected places (*see* diagram facing this page)—

TABLE No. XXXII

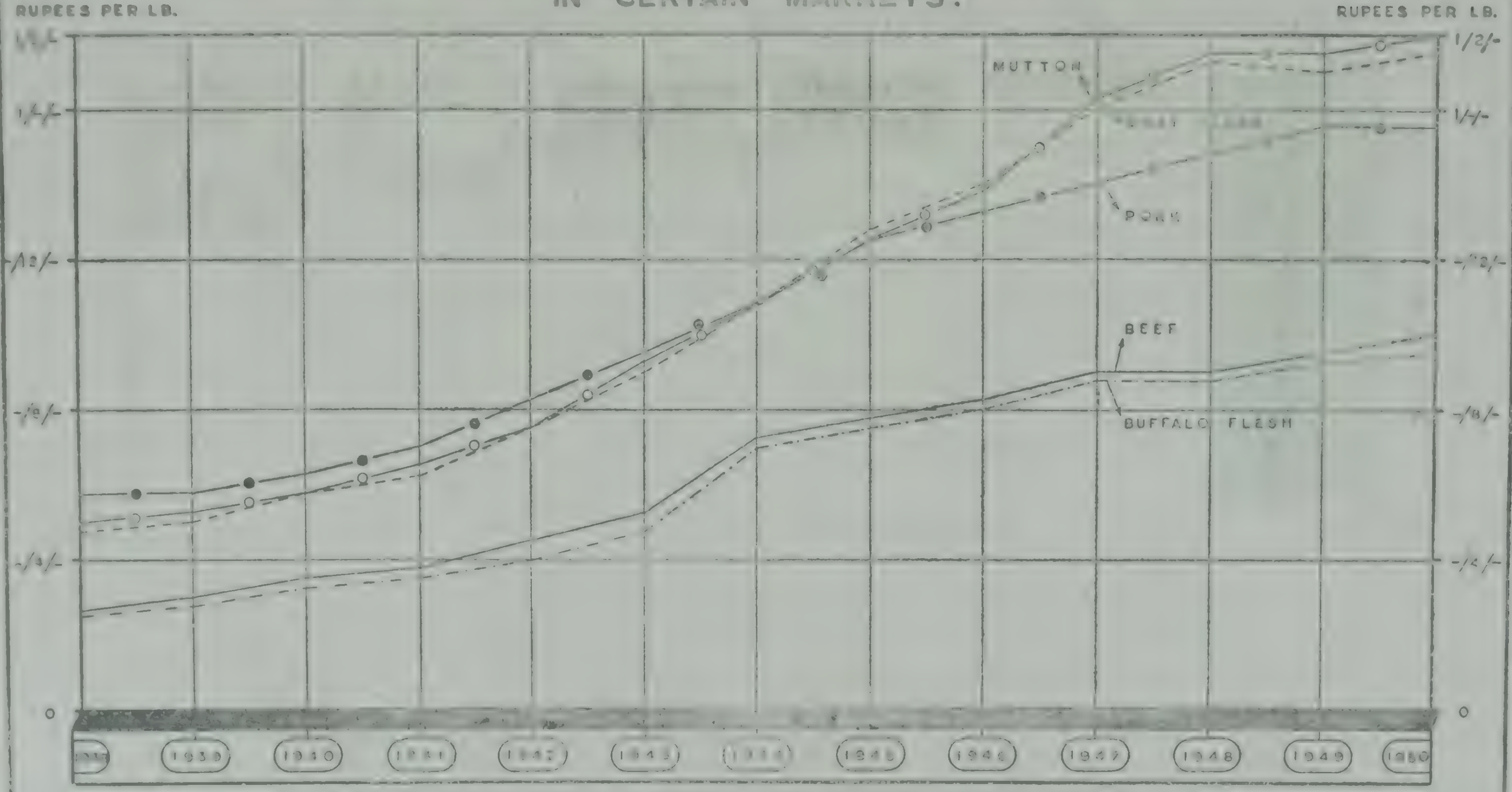
*Trend of prices of different types of meat at certain markets**

(per lb.)

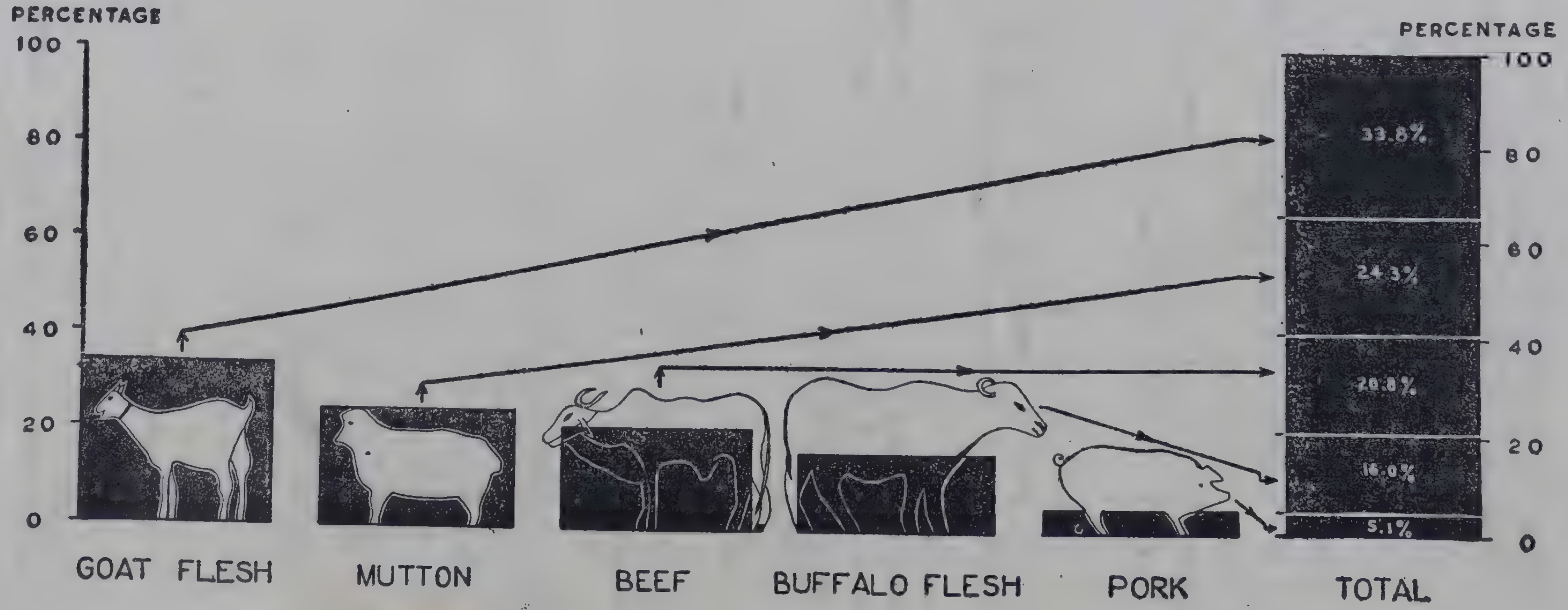
Year	Beef	Index No. (1938 =100)	Buffalo flesh	Index No. (1938 =100)	Mutton	Index No. (1938 =100)	Goat	Index No. (1938 =100)	Pork	Index No. (1938 =100
1938 ..	0 2 8	100	0 2 6	100	0 5 0	100	0 4 9	100	0 5 9	100
1939 ..	0 3 0	112	0 2 9	110	0 5 3	105	0 5 0	105	0 5 9	100
1940 ..	0 3 6	131	0 3 3	130	0 5 9	115	0 5 9	121	0 6 3	109
1941 ..	0 3 9	141	0 3 6	140	0 6 6	130	0 6 3	131	0 7 0	122
1942 ..	0 4 6	169	0 4 0	160	0 7 6	150	0 7 6	158	0 8 3	143
1943 ..	0 5 3	197	0 4 9	190	0 9 3	185	0 9 0	190	0 9 6	165
1944 ..	0 7 3	272	0 7 0	280	0 10 9	215	0 10 9	226	0 10 9	187
1945 ..	0 7 9	291	0 7 6	300	0 12 9	250	0 12 9	268	12 6	217
1946 ..	0 8 3	308	0 8 0	320	0 13 9	275	0 14 0	295	0 13 3	230
1947 ..	0 9 0	337	0 8 9	330	1 0 3	325	1 0 0	337	0 14 0	343
1948 ..	0 9 0	337	0 9 8	330	1 1 6	350	1 1 3	363	0 14 9	256
1949 ..	0 9 6	356	0 9 3	370	1 1 6	350	1 1 0	358	0 15 6	270
1950 ..	0 10 0	375	0 9 6	380	1 2 0	360	1 1 6	368	0 15 6	270

* For details please see Appendix XI.

TREND OF PRICES OF DIFFERENT TYPES OF MEAT IN CERTAIN MARKETS.



PATTERN AND COMPOSITION OF MEAT IN INDIA.



It will be seen that on an average the prices of beef and buffalo flesh, mutton and goat flesh and pork ruled roughly at 9 annas, Re. 1 and annas 14 per lb. respectively during the 1946—50 period. These prices compare favourably with the prices of meat ruling in the United Kingdom and other foreign countries.

Domestic production of meat provided 55 per cent. of its supplies in the U.K. in 1950 at a cost of £147 (Rs. 1960) per ton or roughly annas 14 per lb. at the slaughter-house for beef compared with the C.I.F. price of £97-6-0 (Rs. 1297) per ton or Re. 0-9-3 per lb. for frozen fore and hind quarters imported beef.

Home killed mutton and lamb averaged £191 (Rs. 2547) per ton or Rs. 1-2-3 per lb. compared with £124-4-0 (Rs. 1656) per ton or Re. 0-11-9 per lb. for imported frozen lamb mutton.

Home produced pork cost the U.K. Food Ministry £209 (Rs. 2787) per ton or Rs. 1-4-0 per lb. against £169-11-0 (Rs. 2261) per ton or Rs. 1-3-0 per lb. for imported variety.

It may be observed that in U.K. the retail price is slightly high on account of the high cost of processing and distribution. The Indian conditions of handling and distribution do not stand any comparison with those prevalent in foreign countries.

Offal prices—The edible offals like brain, liver, tongue etc., are all sold separately either by count or weight. The demand for edible offals is largest in cold weather. In big towns like Bombay, Calcutta, Madras etc., offal merchants generally buy most of their regular supplies on contact from butchers, operating in the large slaughter-houses. As late as a few years back, it was customary, particularly in many small town meat shops for the butcher to give away free a piece of kidney or testicle with even a small order of meat. To give to a regular customer a good sized piece of liver or some meat trimmings or some bone as food for the dog was common. At that time these products had little value. It is different now. The price of liver, kidney and testicle is amongst the highest for all meats now and in big towns they do not sell for less than Rs. 1-4-0 a lb. The average prices for different kinds of offals obtained at a few important towns in India can be seen in Appendix No. XII.

E.—Seasonal variation in prices

The seasonal variation in the prices of meat is not so well marked as in the case of some other commodities, although there is a seasonal fluctuation in the demand for meat. The seasonal nature of livestock production and marketing, in a way is responsible for slight fluctuation in prices of meat. The marketing of pigs reaches a peak during the winter months, while cattle are marketed somewhat irregularly with a slight preponderence in the autumn and early winter. It may be observed that the time it takes to increase cattle number is much longer than that for pigs. Cows usually produce only one young per year, whereas sows produce litters of 5/6 piglings each. Pigs are marketed when they are from 9 months to one year of age, whereas considerable number of the cattle marketed for slaughter are not disposed of until they are old and worn out.

Sheep and goats tend to increase in numbers somewhat more ✓rapidly than cattle because it is more common for them to reproduce twice in a year in addition to giving birth to twins. The seasonal variation in the meat prices is, thus, the result of seasonal variation in the volume of livestock marketed. Seasons of large marketings are usually associated with relatively low prices and seasons of small marketings with relatively high prices.

Generally speaking, meat does not keep well for a long time in ✓ summer, and therefore, when there is production, surplus to the requirements, the price is either adversely affected and sometimes it comes down by a few annas per seer in some of the markets. The demand in monsoon, somewhat increases and prices tend to rise because people switch over to meat, particularly in areas where fish is ordinarily plentiful, but supplies become restricted due to rains. In winter, meat does not deteriorate rapidly though kept for hours together. Moreover, because of its heat-producing qualities, meat is more in demand in this season, which accounts for the relatively somewhat high prices noticed in cold weather.

It may, however, be noted that the production of meat itself is not seasonal and, therefore, there is not much seasonal difference in the behaviour of beef, mutton and pork prices.

Seasonal effect on prices, is, however, noticed in case of some hill stations, where the meat prices show a rising tendency, 25 to 50 per cent., with the onset of the summer season because of the increased demand owing to the large influx of visitors from plains.

Increased demand during certain festivals, also occasionally may cause some increase in meat prices, but as they do not occur every-day, their effect, is, therefore, only temporary.

The seasonal variation in prices of different types of meat at important markets is shown in the table below:—

TABLE No. XXIII

Seasonal variation in prices of different types of meat during 1949 at important markets

Month	Bombay					Madras (Moore Market)			
	Beef	Buffalo flesh	Mutton (Per lb.)	Goat flesh	Pork	Beef	Buffalo flesh (Per lb.)	Mutton	Pork
January	0 10 9	0 10 0	1 2 3	1 2 3	1 3 0	0 10 0	0 10 0	1 4 0	1 0 0
February	0 10 9	0 10 0	1 1 6	1 1 0	1 2 9	0 10 0	1 4 0	1 4 0	1 0 0
March	0 10 3	0 10 0	1 2 6	1 2 6	1 4 0	0 8 0	0 7 0	1 4 0	1 0 0
April	0 10 0	0 9 7	1 3 0	1 3 0	1 4 10	0 10 0	0 10 0	1 4 0	1 0 0
May	0 10 0	0 11 0	1 3 0	1 3 0	1 5 0	0 8 0	0 7 0	1 4 0	1 0 0
June	0 10 0	0 11 0	1 3 9	1 3 9	1 5 0	0 8 0	0 8 0	1 2 0	1 0 0
July	0 10 10	0 10 10	1 3 7	1 3 7	1 4 3	0 8 0	0 8 0	1 4 0	1 0 0
August	0 12 0	0 11 6	1 3 3	1 3 3	1 3 0	0 8 0	0 8 0	1 4 0	1 0 0
September	0 11 0	0 10 0	1 3 3	1 3 0	1 3 3	0 8 0	0 8 0	1 2 0	1 0 0
October	0 11 0	0 10 0	1 2 10	1 2 10	1 2 10	0 8 0	0 8 0	1 4 0	1 0 0
November	0 11 0	1 10 0	1 2 3	1 2 3	1 3 0	0 8 0	0 8 0	1 4 0	1 0 0
December	0 11 5	0 10 0	1 3 0	1 3 0	1 3 4	0 8 0	0 8 0	1 4 0	1 0 0
Average	0 10 9	0 10 4	1 2 10	1 2 9	1 3 8	0 8 6	0 8 3	1 3 9	1 0 0

Patna				Calcutta			
Beef	Buffalo flesh	Mutton (Per lb.)	Goat flesh	Beef	Mutton	Goat flesh (Per lb.)	Pork
0 6 0	0 6 0	1 0 0	0 14 0	0 10 0	1 5 4	1 3 5	0 13 8
0 6 0	0 6 0	1 0 0	0 14 0	0 9 9	1 5 4	1 3 0	0 13 8
0 6 0	0 6 0	0 15 6	0 14 0	0 9 9	1 6 3	1 3 5	0 13 8
0 6 0	0 5 6	0 15 6	0 14 0	0 9 9	1 7 0	1 3 5	0 13 2
0 6 0	0 5 6	1 0 6	0 14 0	0 9 0	1 4 6	1 3 5	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 9 9	1 3 5	1 3 5	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 11 8	1 4 5	1 3 5	0 11 8
0 6 0	0 5 6	1 0 0	0 14 6	0 11 8	1 5 4	1 3 5	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 11 8	1 5 4	1 3 5	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 11 8	1 6 2	1 4 2	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 11 8	1 7 5	1 5 4	0 11 8
0 6 0	0 5 6	1 0 0	0 14 0	0 11 8	1 7 5	1 5 4	0 11 8
0 6 0	0 5 8	0 15 11	0 14 0	0 10 9	1 5 8	1 3 9	0 12 0

F.—Relationship between the prices of meat, and other commodities

The relationship between the average annual prices of meat, fish, milk, etc. can be seen from the following table: —

TABLE No. XXIV

Relationship between the prices of meat and other commodities (1951)

Commodity	Price (per lb.)	Percentage increase or decrease over meat prices
Meat	0 12 0	..
Fish	0 15 0	+25
Eggs (per dozen)	1 6 0	..
Milk	0 5 6	—54
Dals	0 5 0	—58
Rice	0 4 3	—65
Wheat	0 2 10	—83

From the above figures it will be seen that the average price of meat is the highest excepting fish in comparison to other commodities shown in the table above. The average prices of milk, pulses, rice and wheat are roughly 46, 42, 35 and 17 per cent. respectively of average prices of meat.

G.—Market intelligence

There is practically no information with regard to prices of meat prevailing at different markets in the country.

The localised character of demand and the lack of recognised standards of quality are largely responsible for the absence of a market intelligence in the meat trade. The trade is mostly in the hands of illitrate butchers and they manage their affairs in their own individual ways. There are no consignors and consignees, nor any large capitalist concerns or corporations engaged in this trade. The absence of imports, exports or big trade in meat has precluded the butchers and others from maintaining any market intelligence service regarding prices, arrivals, stocks etc. The only semblance of intelligence provided in the meat trade is the weekly or fortnightly price bulletins issued by certain important municipalities like Bombay, Calcutta, Madras, Nagpur etc., for guidance of the local consumers. These bulletins do indicate, in a general way, the level of prices ruling for different kinds of meat within the jurisdiction of the concerned municipalities, but often appear to be grossly exaggerated.

The butchers in the urban areas are, however, slightly better placed in this respect. Production is not so casual in character and at each slaughter-house, dealers are found operating on behalf of larger hide and skin commission agents, tanners or shippers. Thus, the butchers at these slaughter-houses, are, to an extent in touch with these agents. This places them in a better position and enable them to take advantage of the favourable turns in the markets, as compared with the rural butchers.

The present machinery for collecting and interpreting these statistics is defective and cannot form the basis of sound planning and development. Accurate market information is essential to the efficient marketing of meat, for it is only when all pertinent facts are available to both buyers and sellers that market prices can be established in accordance with actual supply and demand conditions. Butchers must determine for themselves the use they make of such a service of marketing intelligence.

For developing the trade in fresh meat and for planning marketing improvement work in meat, therefore, the need for a machinery for collecting and disseminating correct retail prices cannot be exaggerated. It is therefore, recommended that a proper price intelligence service should be established in all key markets in the first instance. It is considered that if daily prices for all the types of meat, at the important markets like Bombay, Calcutta, Madras, Delhi etc. are collected and issued to the press in a bulletin form, considerable service could be rendered to the meat trade. The collection of information, its scrutiny and dissemination can best be done by the concerned municipalities in collaboration with the State Marketing Officers. The proposal is commended to the above bodies for their consideration. The Municipalities and Local Boards and others who manage and control the markets should arrange to obtain this information and display and disseminate for the guidance of the buyers and sellers. Its utility will, in fact, largely depend on the extent to which butchers are themselves organised. So long as each butcher believes that he can profit more than his neighbour by following a purely individualistic line, so long are the tendencies of market likely to be mis-interpreted and the severity of these periodic fluctuations in price intensified.

In United States of America, prices, stocks, arrivals and other information collected on the livestock and meat trade are disseminated in a number of different ways. It is made available locally, distributed to other centres by leased or commercial wire, and distributed generally over a wide area by means of radio, broadcasts, telegraphic reports, through press and by telephone. The service gives the meat industry including livestock producers adequate and equal opportunities for understanding past and present conditions and future prospects in the industry.

CHAPTER III—PREPARATION FOR MARKET

General

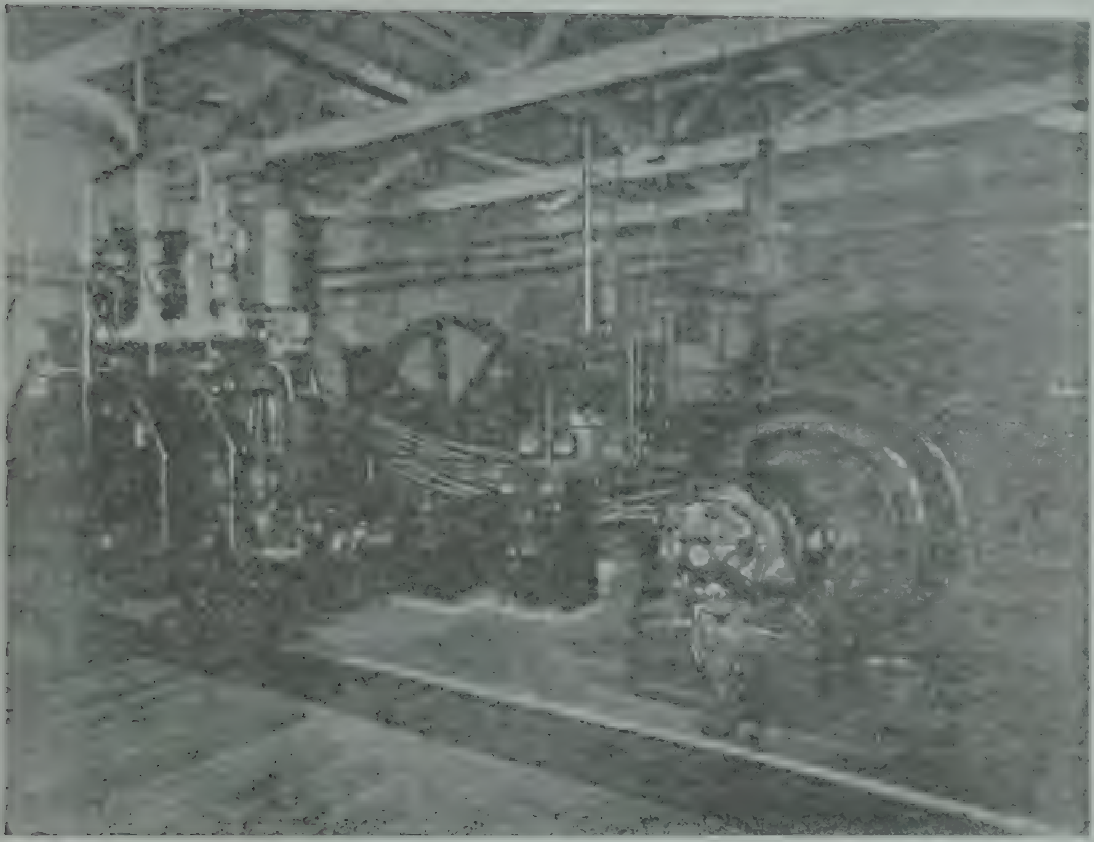
In spite of the remarkable developments that have taken place in meat industry in the progressive countries of the world, the production of safe, clean and wholesome meat supply has been and still is attended with great difficulties in India, and this is particularly noticeable in rural areas. The qualitative aspect of meat production is, however, of the great significance to the nation, since not only does it determine the volume of meat ultimately reaching the consumers in a good condition, but it is also vitally concerned in the maintenance of public health.

✓ The importance of meat as a human food is due to its peculiar physical consistency, its pleasant flavour and above all the highly nutritive constituents—the easily digestible fat, the rich proteins of high biological value, vitamins and minerals so essential for the growth and prevention of diseases—which make up its composition. These very properties of meat, however, render the product highly variable as well as perishable in nature and easily susceptible to microbic infection.

✓ The food value of meat may be impaired through any change in its composition due to natural or other causes, and the meat may become contaminated with pathogenic organisms and it may become unfit either for human consumption or for manufacturing purposes as a result of bacterial activity. Thus the quality of meat as a food and as an article of commercial value may be enormously affected, if it is not properly and carefully prepared for the market.

✓ In highly industrialised countries like England, Australia and America, many important changes have taken place in the type and productivity of food animals. Cattle, sheep and pigs for meat purposes are especially raised on ranches and in regions where corn and cheap grazing is available and breeding stock can be maintained at small cost. Animals are also usually subjected to fattening at younger ages and prior to marketing. To produce the higher grade of meat, it is generally believed that the animals must be fed liberally on grain or other concentrates during the finishing period. Well fattened cattle have a higher carcase yield than animals in poor condition. The final processing also improves the appearance, palatability and digestibility of the meat. The fattened animals are killed, dressed, graded and packed for despatch to markets.

✓ Western countries have also developed a large trade in processed and frozen meat (*see* plates facing this page). Animals, after bleeding, etc., are frozen at a very low temperature and kept in cold storage for long periods. This method of marketing enables surplus animals to be taken off the market and held until such time as required. It helps to even out fluctuations in prices as also enables producers to regulate supplies to their own advantage.



Refrigeration Plant (Compressor) Wellington Meat Export Coy., New Zealand. (No such facilities exist in India).

Mutton & Beef in the Chiller Westfield Freezing Works, New Zealand.

Double deeker trucks are used in New Zealand for varriage of sheeps to slaughter-houses.

In India, however, no such preparation for market is done, so far animals for slaughter are concerned. Only in a few cases sheep are specially fattened on gram, etc. for private slaughter on occasions like *Id* and other festivals. Otherwise, majority of the animals are sent to the market, where they are bought by the butchers and killed according to their requirements without any preliminary preparation.

As the price of beef is generally low, therefore, it pays to slaughter only old and unserviceable animals or those which are surplus or uneconomical to maintain. It is only occasionally that good and useful stock is slaughtered and that also in big cities like Calcutta, Bombay and Madras where cows and she-buffaloes which may still be in their prime are sent to slaughter-houses when they go dry. A fairly large number of he-buffalo calves are also slaughtered as they are not considered to be of much value and use.

The importance of the careful handling of the food animals before slaughter cannot be exaggerated, for unsuitable conditions of road or rail transport frequently lead to injury, lameness, suffocation or transit fever. Road transport as used in New Zealand can easily be followed in India (*see* plate facing this page). Amongst the food animals, pigs are most likely to suffer during transport, as their heat eliminating properties are very limited and they soon succumb to over-exertion. Sheep are also frequently found dead as a result of suffocation.

The marching of livestock over long distances exposes them to the dangers of disease and as the animals are not usually properly fed or watered *en-route*, there is considerable loss in quality and weight by the time they reach the market. It is estimated that cattle lose roughly 4 to 6 per cent. of their live-weight during transit; sheep and goats lose 2 to 4 lb. Pigs lose 4 to 8 lb. weight. In all animals loss of weight varies considerably, and is controlled by the bodily condition of the animal, the season of the year and the duration of the journey. As the condition and keeping quality of the carcase will depend to a great extent on the care expended prior to slaughter these precautions should be considered as an essential part of the technique for preparation of the animals for the market.

Unfortunately in this country, though meat in cities and towns is consumed in considerable quantities, its trade is in the hands of numerous small butchers who think as little of the health and life of their consumers as they do of the life of the animals they slaughter. Meat inspection at a few slaughter-houses in large towns is enforced to some extent but the conditions in these slaughter-houses and the meat inspection therein falls far short of the present day modern requirements. In most of the places animals are slaughtered and sold under conditions of unimaginable squalor, municipal bye-laws notwithstanding. The necessity for proper meat inspection, therefore, is a vital public health measure in India, which should be rigidly enforced in the same manner as is done in foreign countries like United Kingdom, United States of America, Australia, Canada, New Zealand, etc.

✓ A.—Ante-mortem inspection of food animals

The inspection of food animals before their slaughter forms an important part of the slaughter-house procedure. The examination of meat and meat products is laid down under the various food and other laws. This requires inspection of the animals before and after slaughtering and supervision of the preparation or manufacture of food products from them, whenever the meat or meat product is to be sold for human consumption.

Usually in big towns like Bombay, Calcutta, Madras, etc., the animals to be slaughtered are driven in pens where they are allowed to rest for a short while before killing. These pens are small and hold only a few animals and in that way their movement is restricted to facilitate the inspection. In some places, wooden narrow barricades just large enough to permit only one animal to pass at a time are provided and before being sent to the killing room the animals are given an ante-mortem examination by municipal or government veterinarian or meat inspector.

The primary object of ante-mortem examination is to ascertain that each animal which is intended to be slaughtered is in a satisfactory state of health. Really speaking, proper ante-mortem examination should be made on the premises of the slaughter-house in which the animals are about to be slaughtered and amongst others should include (*a*) examination for any evidence of cruelty to animals by over-trucking, over-driving or by any other act; (*b*) examination for the detection of animals in an emaciated condition or affected with disease in any form.

There are various febrile and other conditions such as pregnancy, parturition, skin diseases, nasal discharge, exhaustion, etc., etc., which call for vigilant ante-mortem examination as they affect the quality of meat a good deal. For instance animals suffering from excitement, fatigue or exhaustion, when slaughtered without any rest do not bleed properly with the result that the keeping quality of the meat is greatly reduced.

Fasting an animal for at least 24 hours before slaughter, on the other hand, has a beneficial effect on the carcase. Fasted animals bleed better, while the carcase is easier to dress and has a brighter appearance than when animals are allowed to feed upto the time of slaughter. Slaughtermen claim further that the removal of the hide or pelt is facilitated if the animal has received copious supplies of drinking water during the fasting period.

For these reasons, most of the urban slaughter-house authorities have laid down a rule that all animals intended to be slaughtered shall be brought to the slaughter-house for inspection at least a few hours before the time prescribed. The inspecting officer or his assistant is required to personally inspect each and every animal presented and segregate any that may appear to him for any reason unfit for food.

Ante-mortem inspection of livestock is thus highly important and a valuable safeguard to the health of the meat consumer. It aids in the detection of animals suffering from scheduled or infactious diseases, which are communicable to man. There are also other certain diseases and conditions not attended with any gross lesions and conditions in the carcase albeit they are noxious and repugnant. Therefore, ante-mortem examination is very essential.

As it is, however, the ante-mortem examination is carried out in India in most perfunctory manner. Barring few big municipalities, who either employ full time Veterinarian in-charge of their slaughter-houses and markets or provide part-time officers for this job, there is particularly no inspection carried out anywhere in this country. Even in most of the publicly owned slaughter-houses the meat inspector attends sometime after the animals have been slaughtered. Ante-mortem inspection is thus the exception rather the rule. Since the inspection of animals ante-mortem by a qualified person is important to facilitate timely recognition of sick or unthrifty animals it is recommended that all animals should be inspected ante-mortem at the place of slaughter.

B.—Methods of slaughtering

Slaughtering of animals is probably as old as human race itself. Originaly animals were either hunted or killed mostly for sacrificial purposes and offered to dieties like "Kali" (Goddess of Destruction) and others to propitiate or appease their anger.

In India, food animals such as cattle, sheep and goats are slaughtered according to certain religious rites more popularly known as "*Halal*" and "*Jhatka*". *Halal* is largely practised by Muslim butchers which consist of cutting the throat with a knife and severing the jugular vein and allowing the animal to bleed to death. Every time the throat is cut, the stroke is accompanied to the incantation of a verse from *Quran*. *Jhatka* is followed by Sikhs and some other non-Muslim communities in respect of sheep and goats only. An animal is fastened to a strong wooden pole or a tree by a rope and one man stretches and holds tight the hind legs while the other with a broad sharp knife, sword or axe chopps the head off from the trunk with one stroke.

Apart from the above, some animals are also slaughtered according to the rites of orthodox Jewish church. In this case the animal is shackled and stuck without being stunned. A muzzle is placed over the animal's nose, the neck and throat is cut by the Rabbi (Priest) with razor like blade. After cutting open the throat, the edge of the razor like blade is tested on the finger nail to see if there is any dent on the edge, if there is, it means that edge has touched the neck vertebra, and the meat from such animal is considered unfit for orthodox Jew's consumption. Slaughtered animals which are found on examination to be fit for Jewish consumption are described as "*Kosher*", but a very negligible percentage of the meat consumed in India is from animals slaughtered by the Jewish ritual method.

Owing to physical differences between the different kinds of food animals, the slaughtering methods vary to certain extent as described below, but the usual one is what is commonly called "neck stabbing" which consists of making a bold incision in the neck, with a big sharp knife severing the jugular vein and other main blood vessels and thus bleeding to death. The incision must be skillfully accomplished to eliminate "bloody necks" in which the blood backs down the trachea and esophagus.

Cattle.—The animal shackled by ropes and tightly held by head and horns is thrown with a sudden jerk on the ground rather violently. The neck of the animal is stretched and large vessels of the neck are cut with a big sharp knife some 12 inches in length. The animal is then bled as rapidly and quickly as possible. The convulsive movement of bleeding animal assists in the free expulsion of blood from the body and this in turn enhances the keeping quality of meat. This method, however, involves considerably cruelty to the animal and excessive struggling.

✓*Sheep and goats.*—In case of sheep and goats the legs are not tied, but the animal is thrown on the ground with a quick twist. The animal lying on his left side is struck immediately below and behind the ear with a sharp knife. The jugular vein is severed and the head is jerked backwards breaking the neck. After thorough bleeding the head is cut, the neck skinned and the feet and lower legs are cut off. ✓

Pigs.—The method of slaughtering pigs is somewhat different from that of cattle. After the animal is thrown on the ground, a short rope is tied round the muzzle to prevent biting as well as help to keep the head of the animal pressed to the ground. A straight clean cut about 3½ inches long is made anterior to the sternum with a slightly curved, sharp-pointed knife about 8 inches long, which severs the jugular vein and permits rapid bleeding. The cut is made sufficiently deep so as to pierce through the surface fat layer and a knife is thrust through the cut into the throat to puncture the heart.

At the piggeries under the control of the Indian Army, the pigs are slaughtered by the method called "stunning". The pigs are made to pass one by one through a small wicket iron or wooden door and struck with a heavy iron bar on the neck (head) thus stunning the animal and then quickly splitting open the neck by sharp knife.

It is generally agreed that the two essentials in the slaughter of food animals are that they shall be despatched in as humane a way as possible without unnecessary suffering and that the bleeding of the animal shall be as complete as possible. Good bleeding is ensured if the animal is healthy, but is retarded in all effections which affect deleteriously the action of heart, lungs and muscles, and animals suffering from febrile conditions, from severe indigestion or from severe heart and lung affections, bleed badly and the flesh is therefore of poor durability.

Stunning of pig before slaughter by electricity at Madras in many foreign countries, food animals are not killed by means of cutting the main vein in the neck and bleeding the animals to death as in India. This method is considered to be slow and cruel and hence those countries adopt various mechanical and non-mechanical methods of producing insensibility in the animals before actually slaughtering them. The following are some of the methods in vogue in foreign countries:

(*a*) Non-mechanical apparatus include the ordinary poleaxe, hammer etc.: the poleaxe is used for stunning beasts, and consists of a steal head, one side of which, is an axe, and the other, a short rod, fitted with a wooden handle about 3 feet long. The beast is struck on the front of the head with the rod side of the poleaxe, the rod penetrating the skull. The hammer is used for stunning beasts a great deal in U.S.A., and Argentina and consists of a 6 lb. heavy hammer head, with a round knob on one side for striking the animal, fitted to a long wooden handle. After being rendered unconscious the cattle are automatically ejected from the pen, shackled by means of a chain round both hind legs, hoisted and despatched by a severance of the carotid artery. After this they are left to bleed for about 5 minutes. This system is usually preferred in packing houses and as the brain of the animal is not damaged it results in very efficient bleeding.

(*b*) Mechanically operated instruments for stunning animals are of two types—those in which a captive bolt is operated by a blank cartridge or a strong spring, and with this pattern the action of the bolt is similar to that of a pole-axe. The other types are instruments firing a free bullet.

(*c*) Electrical appliances for rendering animals unconscious are now used in many of the larger slaughtering establishments. This method consists in passing a low voltage alternating current through the brain of the animal, the instrument most commonly employed being one which resembles a pair of tongs. Electrodes placed at the end of the tongs are fitted with spongy material which is soaked in brine before application, the brine overcoming the electrical resistance of the hair and skin and facilitating electrical conductivity when the head of the animal is gripped by the electrodes; the electrical stunning method is ideal for pig slaughter, and is also the best method of slaughter for sheep and goats, as they are more susceptible to the influence of electrical current than are pigs. While in pigs the current may be applied for 5 seconds, experience shows that 2 seconds is sufficient for sheep and goats.

The electrical method of rendering pigs unconscious prior to sticking is, however, not used in the U.S.A., the animal being shackled alive and hoisted mechanically on to the sticking rail. Once on the rails the pigs travel by gravity to the stickers, who despatch them with the normal type of double-edged sticking knife, the blood being allowed to flow on to the floor whence it is pumped away for processing. After sticking, the pigs are normally given a full six minutes on the bleeding rail.

A scientific investigation in connection with human slaughtering of animals have shown that there is no better way of shortening the death agony than "stunning" before actual slaughtering. This makes the animal completely unconscious and insensitive to all pain, as a result of which unnecessary cruelty and excessive struggling of the animal is avoided.

C.—Dressing of carcases

There is no standard method of dressing a carcase and it varies from place to place. A considerable importance is, however, attached to the manner in which the carcase is dressed, as incorrect dressing may entail some loss of selling value. The order in which the different operations are carried out depend on the equipment available but the following outline will give some indication of the general procedure which is adopted in dressing of carcases in this country.

Beef carcase.—Directly the animal is dropped and slaughtered, the butcher or his assistant called "*Kamenewalla*" stands with his back to the animal, with one foot below the head. the other in front of the fore legs, so that the skin of the throat is drawn taut. The end of the brisket is located and an incision is made from just in front of the brisket, on the centre line of the neck towards the head, exposing the windpipe. The knife is then directed towards the point of the brisket and by moving it in the direction of the backbone the blood vessels are cut just outside the chest cavity. The animal is scalped by chopping off the horns and the head is detached by cutting through the muscle of the occipital joint. Flying continues down and over the round, and the feet are removed above the knuckle joints (tarsals). A rip is then made in the straight line over the brisket along with the middle line of the belly to the tail. The hide is removed from the neck and brisket and the abdomen cavity is then opened up by making a small cut behind the briskest, inserting the hand and cutting up the middle line towards the cod fat, the hand being used to protect the vicera from damage. The caul fat is then removed, the bladder emptied, and the vicera pushed to one side, so that the buttock can be split in the case of the young animals with a knife. The brisket is cutdown to the bone and sawn through, and the food and windpipe loosened. The hide is then removed from the round and rump. Following this, the carcase is hoisted up by means of ropes or pulleys, and the weight of the intestines and stomach, with spleen attached, is sufficient to remove them from the abdominal cavity. The carcase is then scrubbed and cleaned and split longitudinally into two halves with an axe and then transversely into two halves, thus divinding the carcase into four quarters.

The average dressing yield for Indian beef cattle ranges from 35 to 45 per cent., while poor grade cattle yield even less of their original live weight.

✓*Goat and mutton carcase.*—After the goat or sheep has been allowed to bleed for a short time the animal is turned on to its back and the foreleg is "knuckled". A cut is made from the knuckle down the front of the leg. The neck and side of the check is skinned off as also a portion of the shoulder. This operation is repeated on the other foreleg. The throat is opened up, sweat bread removed and the food-pipe (oesophagus) tied off to prevent contamination of the flesh. The hind legs are knuckled and a cut made to the root of the tail. The legs are skinned and the sheep or goat is hoisted by a gambrel (a wooden pole) inserted in the hocks. A rip is made down the centre of the loose skin covering the belly and the skinning proceeds over the flanks. The more fist and the less knife at this stage, the better the pelt will be. Following this the pelt is pulled down over the back-bone to the base of the head. A small cut is made in the belly wall just above the brisket and the fingers of the left hand are inserted to protect the viscera as the knife opens the belly wall to within about 2 inches of the cod fat or udder. Following this the "Caul" (omentum) is carefully removed, the rectum is loosened, the bladder taken out and all of the intestines and stomach is withdrawn. the food pipe being pulled up through the skirt (diaphragm). The breast bone is split and the pluck *i.e.* lungs, heart, spleen and liver is removed. ✓

Sheep and goat dress out about ✓40 per cent. of the live weight, choice animals running somewhat higher.

Pig carcase.—Unlike cattle, sheep or goat, the skin is not removed from the pig carcase as it forms an edible part of the pork. After bleeding, pigs are scalded in a crude way to permit easy de-hairing and then scraped. The scalding is done by plunging the carcase into a tank or tub of hot water at a temperature of 138° to 142°F., depending upon the season of the year and the condition of the hair on the animal. In many places hot water is merely thrown on the carcase. After three or four minutes scalded, the carcase is removed, de-haired and washed with cold water to remove away hair etc. The carcase is then ripped open, dressed and divided in the usual way as in the case of cattle. Indian pigs dress out about 60 to 65 per cent. of their live weight.

In United States after bleeding, the pigs are lowered to the scalding tank, usually by means of a chute. The scalding tanks in many cases are as long as 100 ft. and capable of holding 70 pigs. The water is kept at a temperature of 140°F. The time of immersion in most cases is 5 to 7 minutes. From the tank the pigs are raised by conveyor to the de-hairing machine. The next stage is depilation. The carcase is dipped into a tank of resinous substance which hardens as soon as it is removed from the tank. This method certainly gives a clean and well-finished carcase. The next step in the line of operations is to pass the mechanically conveyed carcases through the gas singees. These take various forms, either fixed for the flame to play over the hams, or both fixed and manually operated so that it plays over the whole carcase. After singeing, the carcase is sprayed with water and polished by a series of beaters similar to those in the de-hairing machine. It is then ready for operation.

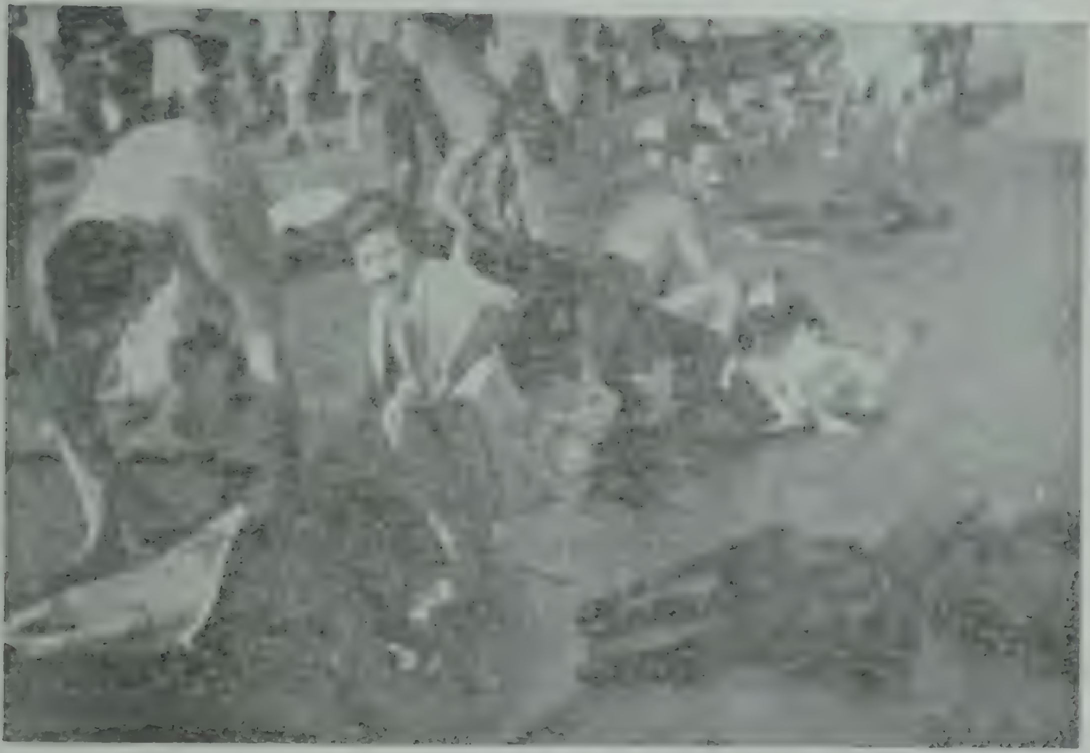
It may be observed that flaying and dressing cause considerable monetary loss if not performed carefully. Many carcases are reduced in value and utility due to carelessness in these operations. On several occasions complaints have been recorded about the unsatisfactory dressing of carcases in India, but as far as could be ascertained, no estimates are available to show the exact loss caused to the country on this account. It must be confessed that under practical conditions, it may not be possible to prevent the loss entirely. But there is little doubt that it can be considerably reduced, at least at the centres of concentrated production.

To some extent, the reason why the standard of dressing does not improve readily in India, is that the butchers, and dressers are too backward and ill-informed to realize that the losses caused by bad flaying and dressing must, in the end redound on them. Besides, general carelessness on the part of dressers, engagement of inexperienced flayers, lack of supervision over flayers and dressers, use of unsuitable knives, insufficiency of space required for the operations, inadequate arrangements for hoisting up of the carcases, poor lighting at the slaughter houses, particularly when the work is to be done in dark hours, payment of flaying and dressing charges on a contract or a piece wage basis, are some of the factors which are responsible for improper and defective flaying and dressing of meat carcases in India.

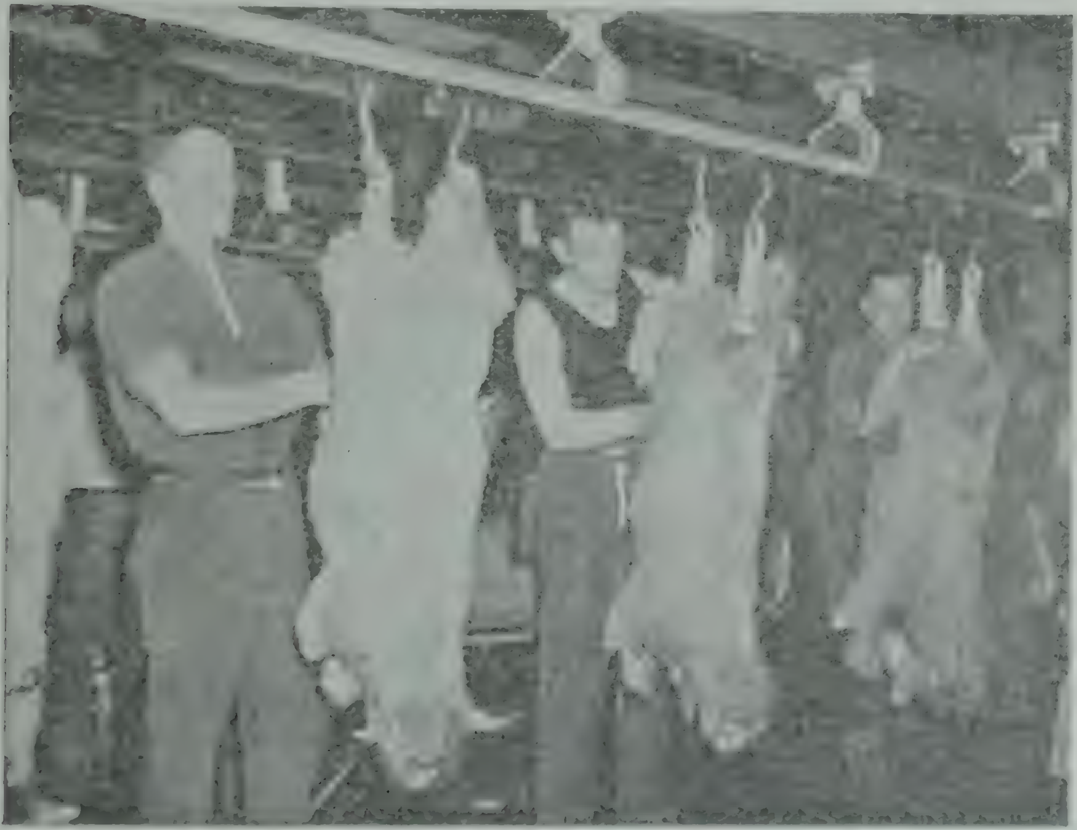
The present deficiencies are often also due to the slaughter houses being too small, badly constructed and inadequately equipped. In such circumstances, it is impossible to secure the observance of reasonable standards of hygiene. Slaughtering and the dressing and preparation of meat and offals can never be wholly free from the risk of contamination, but this makes it the more important that the work should be done in the most cleanly manner possible.

In many foreign countries, the payment of a suitable premium on better flaying and dressing and organisation of competitions in flaying, etc., have resulted in improving the quality of carcases. Organised efforts made in other countries for improving the general standards of flaying and dressing have given encouraging results. Flaying instructors and expert butchers who are Government employees are employed for giving demonstrations at the slaughter houses and better dressed carcases are now being produced there.

Flaying and dressing is an operation which requires considerable skill and experience and if performed improperly it causes monetary loss to the owner. Notwithstanding this, at present there is nothing to prevent inexperienced or amature flayers and dressers taking independent charge of their operations in Indian Slaughter Houses. As far as is known, only at the Bandra Slaughter House at Bombay, the flayers have to be registered. Mere registration of flayers and dressers is not enough. The licenses should be issued only after a test proficiency. The model rules for issuing licenses including particulars of proficiency tests could be worked out by a special committee appointed for this purpose. The number of licenses at a slaughter house should also be so adjusted as to leave no possibility for neglect due to rush of work.



Flaying of sheep and goats under unsuitable conditions at Bandra Slaughter House—Bombay.



Correct way of flaying and dressing sheep and lamb carcases by hoisting—Westfield Freezing Works—New Zealand.

If necessary, special bye-laws may be introduced under the Municipal Acts to prohibit unlicensed flayers and dressers operating at the slaughter houses. It may be advantageous to introduce monthly wages for these licensees, rather than a piece wage system as prevailing at present.

In the rural areas, there is considerable scope for peripatetic demonstration parties giving actual demonstrations of improved methods of flaying and dressing. The main point is that of continuity and repetition of such demonstrations so that the butchers in these areas may ultimately adopt improved methods in the preparation of their carcases.

In this connection, Veterinary Officers posted in the rural areas can also do a lot to improve the conditions by doing propaganda and demonstrating improved methods of flaying and dressing to butchers. For their guidance a bulletin with suitable illustrations may be prepared on the subject.

D.—Characters of sound meat

Sound meat should be firm and fine in grain. It should have a smooth, velvety touch and should be full of sap. It should not pit upon pressure of the fingers, should be of bright uniform colour, and slightly mottled by fine lines of fat interspersed with the lean. These lines of fat disappear with age, and the meat becomes coarse, dry and stringy. It also becomes sticky to the touch and much darker in colour. There should be a pleasant fresh smell from meat. A skewer thrust deeply into the flesh should have no unpleasant or disagreeable odour when withdrawn. The fat should be hard and ivory white and should not be gelatinous and watery. Soundness of the meat is associated with the texture and this depends on the size of muscle bundles and the quantity of the connective tissue. Intramuscular fat "marbling" is a good indication but the question of sap or meat juices must not be ignored. Soundness also refers to other characteristics such as tenderness and colour of the flesh. The soundness of meat depends upon a large number of factors and its determination requires a great deal of experience and skill. The breed, sex, age and food of the animal and the way in which a carcase is flayed, dressed and handled, all go to make the quality or soundness of the meat.

Tenderness depends upon the age of the animal at the time of slaughter, condition and the age of the meat after slaughtering. The meat from young animals is always more tender than that from older, more mature animals. As a rule the meat from a fat animal appears to be more tender. The cuts from the muscles that have the least exercise are more tender than the cuts from the muscles that are in constant use. Many people make tenderness the deciding factor in the selection of meat. In order to be tender meat should be of medium firmness, with fine grain or texture, have a smooth velvety appearance, and be well marbled with fat. Whenever possible, meat should be cut across the grain or fibre.

Large aggregations of fat cells are always present in certain parts of the healthy animal body, such as round the heart, omentum and kidney, but elsewhere their presence in any quantity, depends very much upon the state of nutriment, and represents the nutriment which has been taken into the body in excess of its average consumption. So that the quantity of fat present in the animal body may be taken as very good index of the general health of the animal. The amount of fat generally present in meat, of course, varies from animal to animal.

Beef fat sets very firm, smells sweet, has a pleasant taste, and is yellowish white in colour. Mutton fat is pure white and tallow-like, it sets quickly and becomes crisp and firm. Goat fat is not so white, may be yellow, and does not set so firm as mutton fat. Pork fat is pure white in colour, it never sets, and is always soft and greasy to the touch.

The influence of age, breed and feeding upon the quality of fat is very significant. In old age the fat becomes darker in colour. It is commonly supposed among butchers that in cows there is a greater accumulation of subcutaneous fat than in bulls, bullocks or heifers.

E.—Difference between the flesh and organs of different food animals

(1) FLESH.

The first task that confronts a purchaser is that of determining whether the flesh or cut is beef, pork or mutton. Meat and fat of all animal species possess certain peculiarities which are more or less influenced by breed, sex, age, feeding and condition of health of the respective animals and thus they fluctuate within certain limits. The meat from the various animals can be identified best by the size of the cut, the colour of the muscle and the texture of the fat. Fat has also an important influence on both the odour and flavour of the different meats. Those experienced in the meat trade can even determine the approximate age of a carcase from its size and shape, fat covering, colour and texture of the flesh, size, odour and texture of the bones and other distinguishing characteristics.

Beef and buffalo carcase.—In a beef carcase, the flesh is of a bright, rich cherry red colour. It is fine in grain, velvety to the touch and firm in appearance, with minimum gristle or connective tissue. A healthy beef carcase in a good condition should be well covered with fat on the surface and the meat should show considerable marbeling of fat running throughout its body. The colour varies with the age and sex. When fresh it has faint odour and somewhat sweetish character peculiar to itself (beef). The meat is firm without indication of any undue amount of moisture. In calves from 6 to 15 months old the meat is light red in colour containing but little fat and is of a firm elastic consistency. Meat from older animals and from inferior animals is often darker in colour, coarse fibred and dry in appearance and its fat is quite often more yellow in colour. Beef cuts are larger in size having a white or creamy white, firm and rather dry fat.

Buffalo flesh is generally darker (more reddish brown) and the fibres are coarser and lesser in structure than beef. The odour of buffalo meat and fat resembles that of musk. The fat in buffalo flesh is strikingly white and is drier and less sticky than in beef.

Mutton carcase.—The mutton is light red or even brick-red in colour, bright and glistening, and mottled from the interspersion of fine lines. Mutton is distinguished by the firm, dense, fine fibres; moderately firm in consistence, having white, hard, clear and abundant fat existing between the muscles as well as being plentiful under the skin and round the kidneys. Mutton fat is odourless, white and tallow like, it sets quickly and becomes crisp and firm. Mutton cuts are small, and the lean is bright pink in colour, with white, brittle, flaky fat. It is a somewhat difficult matter to distinguish mutton from goat flesh by examination of the muscle alone, but in the latter the muscle is generally darker in colour and coarse in texture.

Goat carcase.—It is pink red in colour with comparatively very little fat. The darker, coarse flesh of the goat may have a characteristic 'goaty' odour and goat hairs may be found adhering to the surface of the carcase. Goat fat is not so white, may be yellow and does not set so firm as mutton fat.

Pig carcase.—The colour of pork varies according to age, condition of nutrition, and the part of the body, both pale and dark, muscle being observed in the same carcase. The flesh is firm, fine in texture, well marbled and is greyish pink, slightly tinged with red in colour and the entire skin is edible. The pig fat is pure white in colour and more oily or greasy to the touch than that of beef or mutton. High quality in pork carcases is indicated by firmness of flesh and firm, thin, smooth skin, free from wrinkles. A further characteristic of pig flesh is that it becomes nearly white in colour when cooked, while in other animals the meat grows darker on cooking.

(2) ORGANS.

Generally speaking, with two or three more minor exceptions the organs of the sheep and goat are similar to those of the ox. In the shape, the kidneys are simple and the spleen is somewhat circular in shape. The intestines are a little longer being about 26 times the body-length, whereas in the ox they are approximately 20 times the length of the body. The females have two teats as against four in the cow.

In ruminents the stomach consists of four compartments, *viz.*, rumen, reticulam, omasum and abomasum. In pigs, the stomach is simple consisting of a single compartment.

The heart in pigs is less conical in shape than in cattle and sheep. The ox liver is a large solid mass with two lobes, the right one being very large and is chocolate in colour whereas the pig liver is somewhat dark-reddish or brown with 5 lobes of equal size distinctly marked out. In sheep and goat it is of the same form as in the case of cattle except it is small in size weighing roughly 1 to 2 lb.

The differential signs of certain viscera and organs are briefly specified below:—

Spleen.

Cattle.—Long and flat, uniformly broad with rounded edges, in bulls reddish brown and in cows brownish blue in colour.

Sheep and goats.—Blunt, angular, of the shape of a palm of the hand; reddish brown, consistence soft to elastic.

Pigs.—Long, tongue shaped, with the exception of ends which are almost uniformly broad ; cross-section is triangular, pale red consistence soft, loose.

Kidneys.

Cattle.—Consist of 16 to 26 lobules and reddish brown in colour.

Sheep and goats.—Bean shaped, not lobulated, dark brown in colour.

Pigs.—Bean shaped, not lobulated, flattened, brown to yellowish brown in colour.

Tongue.

Cattle.—Pointed at the end and possesses a predominant dorsal ridge with horny processes.

Sheep and goats.—Pointed as in cattle but the free portion is grooved down the middle and the processes are blunt.

Pigs.—Dorsal ridge is absent and the processes are soft and velvety.

Intestines.—The average length of the intestines is as follows:—

	Small intestines.	*Large intestines.*
Cattle	120 ft.	30 ft.
Sheep and Goats ...	84 ft.	20 ft.
Pigs	56 ft.	16 ft.

The following are some of the other differentiating indications between the various species:

Sheep and goats.—In the goat carcase, the sharpness of the back and withers is noticeable compared with the round back and well-fleshed withers of the sheep. Goats usually have a thinner tail than sheep, though there are also short thin tailed sheep. The thorax of the goat is flat, that of sheep is barrel-shaped. Ram carcases are characterised by heavy fore-quarters and relative light hind-quarters. In the goat, the shank bone, or radius, is twice the length of the shin bone or large metacarpus. In the sheep, it is 1¼ times as long. The skin muscles of goats are darker than those of sheep.

The subcutaneous tissue of goats contains less fat and the muscles are not enveloped in fat to the extent that they are in sheep.

F.—Post-mortem examination of meat.

It means examination of the carcases, organ and viscera after an animal has been slaughtered. The purpose of meat inspection at the slaughter houses is to minimise the risk of meat which is diseased or otherwise unwholesome being offered for sale for human consumption. Meat inspection when efficiently carried out, should ensure the rejection of unwholesome meat and avoid unnecessary condemnation. It can also provide assistance to those responsible for combating animal disease and improving animal health. The information resulting from meat inspection can provide valuable evidence of the incidence of disease in particular herds, in particular areas, or in the country as a whole.

Meat may be unfit for human consumption because it is diseased, is infested or contaminated with pathogenic organism, is infested, with parasites, is immature, has an abnormal smell or colour or because it is decomposing, damaged or otherwise abnormal. It is, therefore, necessary that every carcase, and its organs and viscera, should be examined post-mortem for evidence of disease or infestation or of any condition which might render the meat unwholesome.

Inflamation in the lungs, intestines, kidneys and on the inner surface of the chest or abdominal walls, is to be regarded as showing generalised condition. Numerous yellowish or pearl like growths scattered through the organs or on inner surface of the chest or abdominal walls indicate generalised tuberculosis. An abnormal colour of the meat is usually due to the same generalised condition. All generalised conditions are viewed seriously.

The main object of the post-mortem examination thus is to detect and remove from the carcase any organ, viscera or portion of the flesh that may be diseased or unfit and thereby render the flesh safe, sound and wholesome for human consumption. It is, however, only in a very few important slaughter houses where post-mortem examination of the carcases is carried out in this country, the examination being divided into two parts :—(*a*) Inspection of viscera which includes all organs associated with lymph glands. The examination is generally by eye and by palpation. When any abnormal condition is observed, the nature and significance of which cannot be determined by such examination, the organ or gland is incised and the incision is made in such a manner as to avoid soiling, or contaminating or unnecessary depreciating, the value of any part of the carcase or other organs that may be passed fit for human food. It may be noted that in U.S. and other places, it is obligatory that the whole of viscera offals are cut out and placed on a table or rack opposite the carcase concerned. The veterinary inspectors are thus able definitely to identify each carcase with its viscera and offals. This is a very desirable practice which could with advantage be copied, but is not being followed in most of the slaughter-houses in this country. (*b*) Inspection of carcase which is examined for (*i*) evidence of bruising, haemorrhage or discolouration, (*ii*) local or general dropsy (oedema), (*iii*) swellings deformities of bones or joints or other abnormalities in the musculature. The serous membranes (pleura and peritoneum) are examined in every case and after the carcase is split, the sternum, ribs, vertebrae and spinal cord are examined.

When all the parts of the meat animal have passed inspection, a small purple rubber stamp coloured with vegetable ink is applied to a number of places on the animal. This stamp consists of a circle in which appear the words “ Inspected and passed ” and carries the city's name or the concerned municipality's initials on it.

In the United States of America and other foreign countries the Meat Inspection Service is entirely manned by the Veterinarians and the meat inspection laws there virtually make these officers supreme umpires over all questions involving wholesomeness of meat animals or pieces of meat, sanitary conditions of slaughter houses and packing plant and all phases of meat processing. The efficiency of this Service is widely recognised and the public has full confidence that any piece or package of meat which is marked “ *Inspected and passed* ” implies an assurance that any meat which has the mark came from healthy animals and was prepared under complete sanitary conditions.

Unfortunately in India, for want of trained personnel and other difficulties, the standard of meat inspection is not very high and leaves room for much improvement. The system of training Meat Inspectors as followed in New Zealand* may, serve as a model in this respect, subject to modifications to suit the conditions of the country. In that country Meat inspectors are selected for appointment from applicants who have had experience in meat works and livestock background, coupled with satisfactory standard of education. During training, the Inspectors have to undergo intensive course in all the branches of meat inspection. The syllabus for the Meat Inspectors' examination is fixed by regulations under the Meat Act and includes a knowledge of slaughter house provisions and regulations thereunder ; the anatomy and physiology of food animals, parasitology in its relations to meat inspection ; the general principles of hygiene as applied to slaughtering places, including the proper methods and conditions under which stock intended for human consumption should be handled and treated before and after slaughter ; the appearance of the various organs of the animal body in health and when diseased ; diseases and conditions rendering the flesh of stock unfit for human consumption, etc., etc. The examination consists of written and oral sections, the latter being conducted as a practical test in the slaughter houses.

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* Primary Production in New Zealand—Deptt. Agri., 1948, p. 43.

G.—Different joints, market classes and grades

(1) JOINTS

The various parts into which a carcase is divided or cut by the butcher are called the "Joints". Great skill is required in every cutting operation, because the value of the meat depends to a great extent on the appearance and shape of the cuts. One wrongly directed knife cut may greatly lower the sale value of the ham or a loin. The variety of cuts to be made depend on the weight, grade and type of the carcase. No hard and fast rule applies, but demands of the trade influence the method of cutting. The particular way in which cuts are made and the neatness and closeness of trim largely govern the price they will bring on the market. The growing preference of the consumers for smaller joints and cuts makes the size and weight of carcase of prime importance.

The methods used by retailers in cutting meat are thus not uniform. Variations exist not only among different sections of the country but also among dealers in the same locality. Some customers also desire cuts to be made in a certain manner that may differ from the usual method of cutting, and such requests are usually complied with by the butcher. The meat dealer is in business for profit and the method of cutting as well as the quality of meat handled is usually that which best satisfies the customers and which yields maximum profit. Although variations in cutting meat exist, the general method followed in a given locality tends to a considerable degree of uniformity.

Beef and buffalo carcase.—Almost all the cattle killed go to the consumer as fresh beef. For this purpose most of the carcases are split into halves, called sides of beef, approximately equal in weight. The sides are divided transversely into quarters. The cutting into joints and cuts is generally done by the retailer. The two hind quarters are sub-divided into flank, loin, rump, round and shank. The fore quarters are divided into ribs, plate and brisket, chuck, shank and neck.

Sheep and goat carcases.—The sheep and goat carcases may be sold whole, halved or quartered into "hinds" and "fores" or broken into shoulders, legs, saddle, etc.

The cutting up of mutton and goat flesh carcases for retail sale varies according to local custom. Generally speaking, the carcase is first "quartered"—divided transversely between the twelfth and the thirteenth ribs, one rib on each side thus being left on the hind quarters and in the case of mutton the flap or the plate—*i.e.*, the hinder part of the breast—being left on the fore quarters. The quarters are divided as follows :—

(*a*) *Fore-quarters.*—The shoulders are removed and are sold either whole, in halves or divided into three pieces. The breast is then removed and the neck is cut into three pieces.

(*b*) *Hind quarters.*—The leg is divided from the loins by a cut across the chump. The leg, like the shoulder, may be halved or if large, cut into 3 portions. The loins, if not required to be sold whole as saddle, are cut down into chops.

Pig carcases.—Pig carcases are split into halves immediately after slaughtering. The main cuts for domestic trade are hams, shoulders and middles. The other cuts are feet, tail, and cuts obtained from the head. Cuts made from middle are, in general, spare ribs, clear bellies, loins, fat backs and brisket. The method of cutting varies a great deal, depending upon local custom and upon the type of product the butcher wants to produce. The ham corresponds to the rump and round of beef. The ham is one of the choicest parts and one of the more expensive portions of the carcase. If loin roasts are wanted the lower portion of loins is used for that purpose. The shoulder is divided into two, the bottom butt and the top shoulder.

It may, however, be noted that most of the joints and cuts mentioned above are ordinarily available only in those towns and cantonments where the bulk of the population consists of Europeans, Anglo-Indians and others who prefer to have their meat dishes prepared in western style where definite joints and cuts are required for such purposes as roast, chops, steaks, grill, etc. In other places most of beef, mutton and goat flesh is offered for sale to consumers in the same condition as when first dressed. All the carcases are divided into their primal parts and into edible portions and sold in mixed lots. This is largely due to the peculiar system of Indian cooking where meat is mostly stewed or cooked in the form of curry and not roasted or boiled in whole joints as is practised in western countries.

(2) MARKET CLASSES

Classifying and grading constitute a process whereby carcases are divided and sub-divided into smaller and smaller groups, each division being based largely on some fundamental considerations and characteristics. As offered at public markets and slaughter houses, meat carcases represent a wide range in degree of all essential characteristics. Some possess excellent conformation, whereas others are ill-shaped and rough, some are fat and well fed and others are emaciated. Some are young and others old, some heavy and others light, and finally some represent the highest degree of quality, whereas others are extremely deficient in quality.

The classification is based mostly on basis of specie or kind of food animals, although in some cases carcases are further subdivided on the basis of sex conditions, *e.g.*, heifer, cows, bulls, in case of beef cattle; ewes, rams, lambs, etc., in cases of sheep; kids, nannies, etc., in goats; and barrow, gilt, sow and bears in case of hogs. Age and weight selections as yearlings, and light, medium and heavy weights are occasionally considered.

The immediate purpose of classifying and grading carcases is by eliminating extremes, so as to arrange the carcases that the individuals making up a group will present great uniformity and that each carcase will make a near approach to an ideal which has been established for that group. The ultimate object is to make possible an accurate determination of values and intelligible description or reporting of market transactions. Classifying, thus, involves sorting on the basis of sex, age and weight, what grading may be defined as a measure of its degree of excellence based on conformation, finish and quality. Although classifying and grading are complementary terms, they are separate and distinct phases of the standardisation process. Classification necessarily precedes grading.

Generally speaking, no proper classification of carcases takes place in this country. In only certain urban slaughter houses, carcases of various classes of meat such as beef, mutton, pork, etc., found on examination to be fit for human consumption are marked "Passed" along with the identifying mark for the kind of meat as under :—

(*a*) "B" for beef from cows, bulls, heifers and calves.
(*b*) "F" for buffalo flesh.
(*c*) "M" for mutton.
(*d*) "G" for goat flesh.
(*e*) "P" for pork.

The marking is done either on the spine of the animals or on thighs and such mark or marks specify the class of the animal slaughtered. The ink used for the purpose of meat marking is generally indelible and non-poisonous.

(3) GRADING

Grading really means sorting of carcases according to certain pre-determined standards of quality. It tends to eliminate waste and facilitate the marketing process. In addition to the variations of species, differences within a specie in sex, age, condition and heridity also govern the character of the meat. Depending upon certain characteristics, meat of a given specie may be of good, mediocre or inferior quality. There is, therefore, need of a system of grading. The grading of carcases and meat cuts must be based upon observation, there being no mechanical or chemical devices to determine the exact degree of conformation, finish or quality in a carcase.

The term "conformation" refers to the general build, form, shape and contour or outline of the carcase, side or cut. It depends upon such factors as breeding, care and feeding and, except in case of immature animals, upon sex condition. Carcases that possess superier conformation yield a high proportion of the most desirable cuts and a low proportion of the less desirable cuts.

Finish refers to the thickness, colour, character and distribution of fat on the carcase. A high degree of finish adds much to the attractiveness of carcase or cut. Like conformation it is dependent somewhat on inherited tendencies or breeding, but in the main it depends on the quantity, kind and quality of feed, age and sex condition of the animal.

Quality refers to the degree of fineness. In the carcase, it is associated with the tenderness and palatability of the meat. It involves the texture and size of the bone, the smoothness and texture of the flesh and fat, and the strength of both the muscle fibre and the connective tissue. It also involves the quantity, consistency and character of juices or extractives, that surround and permeate the muscle fibre and connective tissue. Superior quality implies fine texture and grain, the minimum of connective tissue, desirable colour of fat and meat typical of the species, firm finish (not soft or oily), juiciness, youth as indicated by the bones, and well-marbled meat. Quality is considered to be the most important of the three grade factors because it furnishes for consumers the most dependable criterion of the merit of meat. The quality of meat, thus, depends upon a number of factors, *e.g.*, breeding, feeding, age and sex which are both varied and complex and its determination requires a great deal of experience and skill.

Colour is not actually a factor of quality but is an excellent indication of the quality of the given piece of meat. Colour in meat is of special commercial importance and influences the market value. Weight is sometimes considered and soundness is very important.

(*e*) Grading of meat, as a rule, is not practised in India. In fact ✓ there are no well defined grades to indicate the various quality factors in the meat trade. In some towns, however, the meat carcases, after inspection, are roughly graded as 1st, 2nd and 3rd. Generally, the carcase of young, mature and good conformation animal falls under first grade and a carcase with little fat and older age is placed in the second grade. A lean and emaciated carcase is graded as third.

(*f*) In contrast to the above, grading of meat is practised on a fairly large scale in America and other foreign countries. Official standards for grades of beef, veal, lambs and mutton have been established. As a consequence, there has been a marked advancement towards uniformity in grading over the country as a whole. This is a development which has obvious business advantages both to buyer and seller. It greatly simplifies and accelerates the work of distribution and selection of supplies. The buyer, whether wholesaler or retailer is in a position to buy carcases on description alone and can rely on obtaining uniform supplies of the required quality and weight.

Standard grades and weight categories are also essential to a uniform and accurate system of price recording ; without them, comparison between prices on different markets or at different seasons may be misleading since they may not refer to comparable produce. Once uniform grade standards for meats have come into general use there will be better understanding of consumer demand and more efficient efforts will be directed towards supplying that demand. Following are some of the beef and mutton grades in common use in America :—

(1) *United States Prime or Grade A*-1.—This is the highest grade obtainable and represents the best beef that can be produced there. The flesh is very firm and velvety in appearance, the fat is usually white and very firm, not brittle and the " marbling " is extensive and uniform.

(2) *United States Choice or Grade* 1.—This grade is very close to Prime in almost every respect. The flesh is smooth and velvety in appearance. The flesh is bright and may range from pale to deep

red in colour with "marbling" which is readily apparent throughout the flesh.

(3) *United States Good or Grade 2.*—This meat is above the average in form, finish and quality. The flesh is moderately smooth and velvety, light to dark red with some "marbling". It usually has a small thinner covering of fat than "Choice" and fat may show a yellowish tinge.

(4) *United States Commercial.*—The flesh may be somewhat soft and watery or slightly coarse. The colour of the flesh may vary from light to dark red.

There are three grades of pork, designated serially one, two and three.

When carcases and cuts of meat are to be labelled for grade, a metal roller stamp, which is more durable and, therefore, preferable to a rubber stamp, applied by the Government Grader or under his immediate supervision is carried down the length of the carcase by a continuous motion. Other imprints of the stamp are so made that the label appears on all the principal retail cuts. The stamping fluid, a pure vegetable compound, is entirely harmless and the imprint usually disappears when the meat is cooked. The stamping ink also must be adherent, quick drying and readily visible, and 1 to 2 per cent. solution of fuchsin fulfils all these requirements. The fuchsin is dissolved in just enough acetic acid to bring about its solution; glycerine then being added to make up the required quantity of ink. A stamping ink used in America has the following formula:—

Water	1.8 quarts.
Grain alcohol	1.5 quarts.
Cane sugar	1 lb.
Methyl violet	1.25 oz.

The sugar is dissolved in the water, the alcohol then added, and finally the methyl violet. The solution being stirred and allowed to stand for 12 hours before use.

The difficulties involved in the establishment and general use of standard classes and grades of carcases are recognised by all. Different animals yield different kinds of carcases and each carcase produces many different cuts. To classify or grade them is consequently much more difficult than the grading of many other agricultural products, such as wheat, cotton, tobacco, eggs, etc.

When the United States Bureau of Agricultural Economics first offered the tentative standards for beef carcases, the proposal met with objections on the part of some slaughterers and others in the meat trade on the ground that beef carcases could not be successfully sorted into as many as 7 grades. However, the subsequent recommendation of the Institute of American Meat Packers that beef carcases should be sorted into 10 different grades indicated that the earlier objections were not well founded and that it was practicable to grade carcases and meat cuts. The official grading and stamping of beef carcases and cuts by graders employed by the Federal Government was begun on an experimental basis at Chicago in May 1927. The service was soon extended to a number of other cities including Boston, New York, Philadelphia, Washington, etc., and the following year it was placed on fee basis and became a permanent part of the marketing work of the U.S. Bureau of Agricultural Economics. The Federal Meat Grading Service, which is compulsory and very comprehensive, has been considerably expanded in recent years and is now available at practically all slaughtering establishments. The grading and grade stamping of all beef, veal, lamb and mutton carcases and wholesale cuts are mandatory, pursuant to regulations of the Office of Price Administration. Official graders, stationed in various cities, are subject to call by packers, wholesalers, retailers and others. Whoever requests the service pays at the rate of $2.20. Though varying slightly in different plants and according to the number of carcases to be graded, under favourable conditions the cost of grading is no more than 5 to 6 cents a carcase. Although the amount of meat that is being officially graded and stamped represents a relatively small proportion of the total, the fact remains that official standards are in actual increasing.

In India, the initiative for establishing the standard grades of meat by the butchers can only be created provided there is a demand from the consuming public for better class of meats. The effective way to accomplish this would be to pay for the meats on a basis of quality standards. The buyers in the assembling markets would not think of purchasing the meat on quality basis unless they, in turn, are assured of the standard quality. It is, therefore, suggested that for improving the trade and also the quality of meats, the buyers and sellers should co-operate in evolving a simple schedule of standards and grades for meats. Some spade work can be done in consultation with the trade, in framing a draft schedule for grading meat and it will be for the trade to accept it as a basis for further decision before finalising it on all-India basis. The more general adoption and use of uniform standard is likely to be one of the most important developments in the field of meat marketing in the years that lie ahead.

Advantages of meat grading.—Any system of evaluating products is certain to possess certain advantages, and meat grading is no exception. Some of the advantages of grading would be :—

1. The average consumer is not a good judge of the quality of the various kinds of meat that are on display. However, if the meats were correctly graded and labelled, the consumer would be in a position to select the grade that meets his particular requirements.
2. Grading facilitates large-scale purchasing by city institutions such as hospitals, hotels, restaurants, messes, dining cars and other large users of meats, chiefly because they can place large orders and obtain uniform products. Such large orders are usually on a contract basis, with certain specifications set forth.

3. The grades of meat generally would correspond rather closely to the on-foot grades. They therefore would provide a very important correlation for the benefit of producers. The payment of a premium for a quality products would be a definite stimulation to improved breeding and feeding.
4. Finally grading would make meat market reports more intelligible.

II.—Physiological conditions which may render flesh unwholesome

There are many physiological conditions such as pregnancy, emaciation, immaturity, febrile, suffocation, etc. etc. which may render the flesh unwholesome for human consumption.

1 *Pregnancy.* It is generally believed that the flesh of animals in advanced pregnancy is of poor quality because such animals often bleed imperfectly. The tissues of animals in an advanced state of pregnancy have a high moisture content and a pale, flaccid appearance.

2 *Emaciation.*—Emaciation is found associated with the old age and chronic diseases and is characterised by debility and loss of strength. After slaughter the carcase as a whole presents a moist, watery appearance and does not set, and in more advanced stages may be dropsical, fluid being present principally in the abdomen, renal capsule and pelvis. The fat is scanty and the muscle is pale, loose, moist and flabby and 'pits upon pressure'. Severe parasitic infection may bring about emaciation or it may develop rapidly in febrile diseases. In such cases there is generally absence of fat throughout the carcase and the muscles are often atrophied, pale, loose and moist and exude a watery fluid.

3 *Immaturity.*—In the case of immaturity the flesh is loose, flabby, tears easily and can be perforated by the pressure of the fingers. It has water-soaked appearance and is greyish red in colour. There is an absence of general mascular development as also absence of fat in the carcase. Such meat has no food value. This is, however, applicable to calves only, as young pigs, lambs and kids etc. are consumed when only a few weeks old.

4 *Exhaustion.*—Animals suffering from the effects of exhaustion and fatigue, when killed, do not bleed properly with the result that decomposition sets in quickly and meat does not set well. The defective bleeding may be due to some disease but mostly it is the result of fatigue or over-exertion caused by long transportation. The condition of such a carcase closely resembles that of an ill-bled moribund animal.

5 *Asphyxiation.*—Asphyxiation or suffocation sometimes occurs in transit mostly in sheep and pigs due to overcrowding. In such a case if bleeding and dressing can quickly take place, before the vital functions have actually ceased, the carcase is but slightly effected and may be passed. Generally speaking, however, it is noticed that in asphyxiated animals the lungs are always congested and full of

dark blood, and the liver, spleen, intestines walls etc. are usually full of venous blood and as such the flesh is rendered unwholesome and unfit for human consumption.

6 *Wounds, Injuries, etc.*—Small wounds unaccompanied by septic changes such as those so frequently observed on the backs and buttocks of animals due to the prods and dabs of 'drovers' sticks simply require cutting down. Large wounds, however, may necessitate portions or whole of the carcase being condemned owing to the large extra-vastion of blood which accompany them. When wounds are multiple and severe, suppurating or gangreneous, the carcase may be ill-bled and badly set, condemnation of the whole carcase should under these circumstances must take place.

7 *Fever etc.*—Fever may be regarded not as a disease but as an important symptom accompanying many diseases. It is characterised by a high temperature due to the presence of toxic products of any pathogenic bacteria in the blood, which produce certain alterations in the flesh after slaughter. The meat of highly fevered animals does not set, the muscle being dark red in colour and wet, slimy or soapy to the touch. Slightly fevered carcases not in an ill-bled condition and presenting no evidence of septic infection may receive a liberal decision but condemnation must take place if there are any signs of acute fever, or the animal having been slaughtered in a dying condition.

8 *Abnormal odour, taste and colour.*—Meat may possess an abnormal odour and taste due to sexual activity of the animal, and especially is this associated with boards and buck goats. It is most pronounced in old bores and somewhat resembles the smell of stale urine. A sexual odour may sometimes be noticed in living bulls and rams, but it is rarely perceptible after slaughter, or sufficient to render the meat repulsive and unfit for food.

The feeding upon certain odoriferous substances will cause the tissues to be permeated with repulsive odours and tastes. The fat of pigs which have been continuously fed upon fish, or fish meal, has a pronounced fish odour and taste. Sheep which have been fed for a period upon turnips acquire a strong taste and odour.

An intense yellow colour of the fat is commonly observed in pasture-fed bovines and aged cows. Cattle fed upon oil-cake have a mild yellow colour of the fat whilst in pigs continuously fed on corn maize the fat is lightly yellow.

9 Fleshy organs or carcases falling under one or more of the following conditions which render them unwholesome, unsound or otherwise unfit for human consumption are also condemned.

(*a*) Diseased conditions caused by bacteria or animal parasites which are pathogenic to the human beings.

(*b*) Presence of poisonous substances in the flesh.

(*c*) Structural alterations that render the flesh, organs or the carcase unsigtly or otherwise repulsive in appearance.

(*d*) Conditions that render the flesh innutritious.

I.—Conditions which always render flesh unwholesome

Most common cases for condemning carcases are generalised tuberculosis, pneumonia, pyaemia, septicemia and peritonites etc. In the case of all contagious and other infectious diseases such as anthrax, haemorrhagic septicemia, johne's disease, acute foot and mouth disease, erysipelas, mastitis, contagious abortion, rinderpest, tetanus, etc. etc. the entire carcase and all the parts, organs and also blood thereof are condemned and carefully destroyed.

Among the less important diseases of animals, that may affect the meat directly or indirectly and render its use undesirable or even dangerous for human consumption are foot and mouth disease, Cow pox, supperative infections of the body, diarrohea etc.

There are several other conditions such as extensive and severe bruising with or without gangrene, pronounced anaemia, acute fever, rickets with mal-nutrition, as also immaturity, still-born or unborn carcases which render the flesh unwholesome for human consumption.

J.—Effects of diseases on flesh

Diseased conditions caused by bacteria or animal parasites that are pathogenic to the human beings or the presence of poisonous substances, render flesh unwholesome and unfit for human consumption.

Many of the lesions observed in a carcase during post-mortem examination are the result of inflamation either acute or chronic. The condition may be localised or generalised. A purely local form is frequently the result of injuries to tissues by bacteria, parasite or some other metabolic abnormality. In these cases, the lesions are more or less confined to certain areas only. Acute inflamation in heart, lungs spleen or kidneys is serious and frequently calls for the condemnation of the whole carcase. As a rule a diseased condition always causes, a deleterious and unwholesome effect on flesh.

The lesions in tuberculosis in majority of the cases are confined to the respiratory organs or to the lymphatic glands. A tubercular lesion may be (*a*) caseous containing creamy or thick pus of cheesy consistency, (*b*) encapsulated lesion is usually found in the form of one or more nodules in the lungs or liver, each being surrounded or enclosed by capsule of fibrous tissue.

Pyaemia is caused by pus producing organisms which enter the blood stream directly through local suppurations. There may be suppuration focii in the form of small abceses in the lungs, liver, kidneys, plura and peritonium. Such a meat is considered highly dangerous because the toxins in the meat are not destroyed even by cooking.

Man may become infected with a very serious disease called Trichinesis through the eating of raw pork. This disease is caused by parasites called trichinae, which are too small to be seen by the naked eye but may be present in the lean meat of hogs. The danger of trichinesis may be entirely avoided b ycooking pork thoroughly

K.—Post-mortem changes in meat

A period of time usually elapses between the despatching of an animal and the consumption of a part of the carcase as food. Normally the length of much of this period is governed by the necessities of commercial practice in making meat available to the consumer.

Chemico-physical changes in animal tissues after death consist of gradual dissipation of body heat and coagulation of the myesin in straited muscle, producing the acid reaction of rigor mortis, which may be termed simple souring. This souring or ripening process of meat is a desirable change which increases the keeping quality of the meat and at the same time renders meat more tender and palatable ; it is characterised by a hardening and contraction of all muscles, by a loss in transparency of the surface of the meat, which becomes dull. It is most essential that the escape of body heat and rigor mortis, should be facilitated in every way, such as by allowing sufficient ventilation and air space for the carcase to quickly cool, otherwise fermentation takes place which causes the meat to smell offensively. Afterwards the growth of putrefactive micro-organisms turn "ripening" into decomposition.

Ordinary decomposition of meat is a bacterial process. The organisms first attack the surface of the meat, gradually working into the substance. The physical characteristics of meat undergoing putrefaction are a dark red and dry surface, this being the first sign of the action of aerobic putrefactive organisms. Later the muscle becomes soft, flabby and watery, pale in colour, with a sour odour, and when putred the meat is sloppy, tears easily and possesses an offensive odour. The decomposition of fat or meat containing a high proportion of fat is characterised by the development of fatty acids, rancids odour and taste, and often a greenish discolouration of the fat due to growth of moulds.

Humidity is of great importance in governing the types of micro-organisms that will develop on or in the meat. High humidity favours the growth of bacteria and moulds on the surface of the meat. Low humidity lessens the danger of surface moulds and bacterial growth but if too low, it will cause greater shrinkage in the weight and result in the darkening of the meat. Moisture also aids in the decomposition of meat and for this reason it is important that carcase be kept in as dry a place as possible.

Meat becomes more tender and palatable when allowed to ripen or age for a short time. During aging the meat becomes more tender due to the action of the autolytic enzymes, chiefly " Kathepain " but loss of desirable bloom occurs during aging. If it were not allowed to cure but consumed immediately after slaughtering the meat would be tough because of the coagulation of muscle proteins and solidification of fat (rigor mortis).

Deterioration in appearance may be due to surface moulds slimes, surface drying, shriveling and loss of colour.

L.—Meat poisoning

The presence of poison or poisonous substances in the flesh may cause meat poisoning. Such poisons may be (*i*) bacterial poisons, or toxins generated in the living body by pathogenic bacteria or (*ii*) mineral or vegetable poisons introduced into the living animal, added to the flesh as a preservative after death. Structural alterations due to extensive and severe bruises may also in some cases cause meat poisoning. In fact all the sick or unthrifty looking animals should be regarded as a potential source of food poisoning organisms.

The most deadly form of meat poisoning is that associated with the Bacillus Botulinus, the toxin of which is one of the most potent among the known poisons. The infection is usually found in tinned or otherwise preserved meat. A high death rate is traceable to outbreaks ascribed to this cause and the great variety of ways in which this may take place, points to the necessity of the great care which should be taken to secure absolute cleanliness of persons and premises, concerned with handling of meat and its products.

Many conditions caused by putrifactive and other organisms, *i.e.*, Pyaemia, and Septicemia are considered highly dangerous because the toxins in the meat are not rendered harmless even by cooking. Streptococus infection of the udder which is rather of frequent occurrences may cause food poisoning, often leading to severe vomiting, diarrhoea and collapse. Infections with organisms of the Salmonella group are not infrequent in cattle. The microbes may gain access through some source and cause food poisoning in man.

Without attempting to minimise the dangers of meat poisoning from the consumption of any form of septicemic flesh, it is of importance to mention here that the very worst type of sepsis, from the standpoint of meat inspection is that produced by the retention of the placenta giving rise to spetic metritis. No figures for meat poisoning cases in India are available but recent statistics for food poisoning issued by the Ministry of Health in Britain for 1950 reveal the following : "There has been a formidable increase—7,503 reported cases with over 17,000 people known to have been affected. The outstanding fact is that 48 per cent of all the cases were caused by processed or made-up meat foods such as pies, sausages, brawn, cold meats, stews, etc. etc. Another disturbing fact is high incidence of food poisoning outbreaks in school and works canteens. It may be noted that it is far easier to investigate food poisoning cases in canteens, as the tracing of consumers is far easier, commercial establishments serve many more meals to people who cannot afterwards be traced".

The manifestations of meat poisoning vary considerably but generally speaking are nausea, vomiting, diarrhoea, giddiness, headache, dizziness, and debility which may increase to fainting, while in children and weak persons cholera like symptoms have also been observed. Recovery is the rule but deaths have been observed especially in children.

M.—Preservation of meat

General

Meat is highly perishable, and in the time which intervenes between dispatching and the use of meat as food, protection must be provided against several factors of spoilage. The chief factors which operate to produce spoilage are: (1) micro organisms such as bacteria, molds, and yeasts; (2) air, producing oxidative changes or dehydration ; (3) light acting catalytically in the oxidative changes attributed to air ; (4) enzymes, which can cause autolysis of the protein tissue or hydrolysis of the fats and other changes. In some instances, limited action by any one of these factors, which ultimately can cause spoilage, produces changes usually regarded as desirable, *e.g.*, the mild autolysis of the protein which occurs in aging and tendering. Of the factors listed as involved in meat spoilage, the action of micro organisms is without question the most important. Bacteria can cause many types of spoilage. The presence of large numbers of bacteria causes off-flavors, discolorations, slime, etc., and ultimately decomposition. Molds develop into objectionable visible growths and produce undesirable flavors and odors. The destructive action of air is usually limited to the production of discoloration, rancidity development in the fatty tissue, frequently with the assistance of a catalyst such as light or bacteria, and to dehydration. Light fades certain pigments and promotes rancidity. Enzymes, naturally present in the tissue, cause the hydrolytic changes mentioned above.

Control of the factors listed here constitutes preservation of meat. Through the ages there have been developed various methods of controlling some or all of these factors in order that meat may be preserved for some period to suit the convenience and need of man. Cooking was probably the first preservative to have been used by the primitive men. As cooking came into use, men learnt that the cooked food usually lasted longer than similar fresh food.

Salt was unknown to the primitive races, but came into use in the early times. When Columbus discovered America, he found the natives preserving meat by cutting it into strips, rubbing it with salt and placing it in tree tops or on long poles above the "fly linc" where insects would not contaminate it. Hundred of years ago the explorer Pizzare, conquered Peru, found the natives there curing meat in the same manner. The process was not new, it had been handed down, so that the curing of meat for future use after slaughter was a common enough practice. Actually, curing meat is about as old as man himself, and a way to cure it was probably first discovered by accident, just as the first roast pig, according to an old story, was tasted by accident, after a farm house burned in China. Curing techniques have since been undergone many changes for better.

Preservation by smoke followed and is of much value from an cepicurean side as well as a preservative. Some of the everyday foods of to-day are smoked. Dehydration followed and is also in common practice to-day. All these methods of preservation either kill or inhabit the bacterial and mould growth, thereby delaying the action of putrefaction.

The preservative action of ice and mechanical refrigeration are comparatively more recent welcome finds. As the science of refrigeration progressed, man again borrowed an idea from nature and conceived that if cold above the freezing point of water would keep food-stuffs in an edible condition for several days or longer, then a more intensive cold, or cold below the freezing point of water, should maintain food-stuffs in good condition for very long periods. In this way the practice of slow freezing came into use, to be followed at a later date by quick freezing. In the present era, many food chemists and technologists consider quick freezing as preservation by refrigeration at its best.

Freezing has many advantages over the old methods of conserving surpluses such as smoking, salting or sun-drying. Freezing ensures months later, out-of-season supplies of meat in their natural fresh condition. Meat frozen and stored can be kept safely for months on end, without losing its food value, flavour or its natural appearance. This method is universally practised in many foreign countries and is of great importance in stabilising of markets. Meat, specially mutton produced in Australia and New Zealand is marketed in Europe as frozen meat in considerable quantities.

The following are some of the methods used for the curing and preserving of meat in foreign countries:—

(1) MEAT CURING

It is the process whereby certain materials known as curing agents are introduced into the meat for a fixed period of time with the result that the meat product is altered in a characteristic fashion in regard to its keeping quality, flavour and colour. Many meats like ham or bacon are smoked in addition to being cured. In general, there are four methods of curing meat as under:—

(*a*) *Sweet-pickle curing.*—In the sweet pickle process, the meat is placed in large water tight vats together with a mixture composed of salt, brine, sugar or some similar sweetening agents, and a small quantity of nitrate of soda. The curing room must be held at a steady temperature between 36°F. and 40°F. This cure is applied mostly to ham cut from pork, and its cuts from the shoulder and belly. The cure requires from 15 to 45 days depending upon the nature and weight of the cut and the strength of cure desired.

(*b*) *Dry-salt curing.*—The dry salt method is used for some of the heavier cuts of meat. It consists of rubbing salt on the surface of the meat and stacking with salt between the layers, around the edges and on top.

(*c*) *Dry curing.*—This method is used mostly for bacon and other cuts requiring a mild cure. The meat is packed very lightly into water-tight containers with a slight sprinkle of salt, sugar and nitrate of soda between the layers. In this method the meat cures in its own juices.

(*d*) *Injection cure.*—In recent years there has been quite a development of the so-called "arterial" method of curing. The curing ingredients are introduced in solution form into the arterial system of hams and shoulders. The cure is forced in under pressure through a hollow needle inserted in the exposed ends of the arteries. The cuts are then submerged in a cover pickle. The time required for the cure to be effected is greatly reduced in this way, because it is not necessary to wait for the cure to diffuse from the outside to the centre of the cuts.

The curing of ham naturally varies according to the locality and type of product required. In United States the general practice is to cure by artery pumping. This is done very elaborately by placing the ham on scales graduated in weights and percentages, the operative then pumping under pressure upto 10 per cent of the weight of the ham. The ham is subsequently placed in large tubs containing brine for 7/10 days. In some cases hams after pumping, are put straight into the smoke house where they are smoked and cooked in one process.

The salt is used to preserve the meat and prevent spoilage. It extracts water from the tissues tending to make it hard and dry. The sugar softens and neutralizes the harshness of the salt and improves the flavour of the meat. The nitrate of soda serves to maintain the attractive colour of the meat, reddish or pink, and may have an additional preservative function.

(2) SMOKING OF MEAT

Smoking is another form of processing that has been a common food practice for centuries. The smoking process not only preserves meat and makes it possible to keep the smoked product without refrigeration for a considerable period of time without harm, but it imparts to the finished product a flavour that may be obtained in no other way specially when hardwood sawdust is used in a room or cabinet that will hold the smoke around the product. The smoking operation requires a minimum of equipment. About all that is needed is a suitable smoke house and such minor accessories as are necessary to properly hang the pieces of cured meat that are to be smoked. The commonest type of smoke house is one made of sectional steel. Their walls are insulated so that the heat will not escape into the room in which they are located, and the meat is usually automatically controlled. The heat is furnished by gas burners. Hardwood sawdust is placed in a pan immediately above the burner. The pan is removable so that the ashes from the sawdust may be emptied from time to time. The temperature of the smokehouse should never be above 115°F. The evaporation of water from the lean pork results in a shrinkage from $1\frac{1}{2}$ to $2\frac{1}{2}$ per cent. Dried beef, properly smoked at 135°F. and later dried is stated to lose 25 to 35 per cent of its green weight, 100 pounds yielding 70 pounds. Some smoked products are (1) cured ham and (2) cured bacon. Cured bacon has a slightly smoky odour and should be mild and sweet in flavour, whereas cured ham is sweet and pleasing in flavour, has a smoky odour and fine firm grains, *Bacon and sliced bacon.*

The word 'bacon' is said by one authority to have been derived from the old German word "baec" which means "back". However, others express the opinion that the word may have been derived from the noted Englishman Lord Bacon, for the reason that the crest of Lord Bacon depicts a pig. In support of the latter story, it can be said that bacon has for many years been a favourite item in the English menu.

The general practice in America is to produce bacon almost entirely from bellies, constituting about 20 per cent of the deadweight carcase; Bellies gravitate to the chill-room or cellar where they are graded by weight; subsequently they are packed one layer at a time into rectangular boxes of approximately 24 by 36 by 20 inches, made either of hard wood or galvanised metal. Each layer is covered with a standard curing mixture produced by one of the commercial laboratories, and tightly pressed down with a lid fitted to the container. The time of curing is approximately 12/14 days. The Canadian type bacon is normally stitch-pumped prior to dry salting.

For sliced bacon cured bellies, either smoked or green, are chilled, then pressed into rectangular shape, and subsequently passed to the slicing machine. The "shingled" slices, as they are called, are divided into approximately ½ lb. or 1 lb. lots and passed next on to the main wrapping conveyor, where the operatives checkweigh and insert the bacon in cellulose film window-envelopes, and seal them. The sealed packages are then put into fibre board cartons for distribution.

In certain instances this system has been modified to include vacuum packing. In these cases the bacon is placed in envelopes of laminated "Pliofilm" or cellulose film. The packages are placed into the rotating pockets of a sealing machine which removes the air and heat-seals the packages. The object of this process is to improve the keeping quality of the product.

Sausage :

Sausage usually consists of a comminuted meat, to which may be added spices, water, dried skin milk, or other ingredients all of which are contained in a casing. The chief meats employed in making sausage are beef and pork. Sausage may be made of fresh or cured meats. It may be smoked or not, and it may or may not be cooked in this packing plant. Casings are usually of animal origin, but in recent years some sausage has been enclosed in systematic coverings made of regenerated cellulose.

It may be stated that meat preservation on any commercial scale is not practised anywhere in India. Ice is commonly used but mechanical refrigeration is only occasionally made use of in a few urban areas like Bombay, Calcutta, Madras, etc., where such facilities are available for preservation of meat in cold storages. Likewise the preservation of meat in cold storage is also practised by ocean going steamers and railway restaurant cars wherever such facilities exist. Drying of meat in open sun is the most primitive method of conserving meat. Before the War a fairly large quantity of "Burma meat or *Biltong*" was manufactured in Delhi and Uttar Pradesh, specially Agra district. The process depended on cutting buffalo meat into long strips, smearing them with salt or salt peter and drying them in the air under the shadow of large trees during winter season. The meat was exposed to sun for about 4 days with constant turnings so as to thoroughly expose the strips to the sun. The sun-dried meat was thereafter packed in bales each weighing about 4½ maunds and shipped to Burma, Malaya, etc. On an average 3 maunds of fresh raw meat yielded roughly one maund of dried meat and the cost of production worked out to Rs. 10-8-0 per maund or 2 annas per lb. of dried meat, as against selling price of Rs. 12-8-0, thus leaving a profit of Rs. 2-8-0 per maund.

In some places Baluchistan "Dumba" meat (fat tailed sheep) particularly is sometimes preserved in winter season in the following way. After the animal has been slaughtered, enviserated and dressed the carcase is sewn and placed on a big tripod, slow fire burning underneath. As soon as the flesh gets reddened the carcase is removed and washed in water. The carcase is deboned, washed again and cut into two parts along the backbone. A mixture of 1½ lb. of asafoetida roots and 8 oz. salt is applied on all parts of the body. All fattened portions of meat are incised lightly and stuffed with above mixture, and placed on wooden planks for drying. The cost of drying is stated to be as much as Rs. 5-12-0 per carcase.

(3) DEHYDRATION OF MEAT

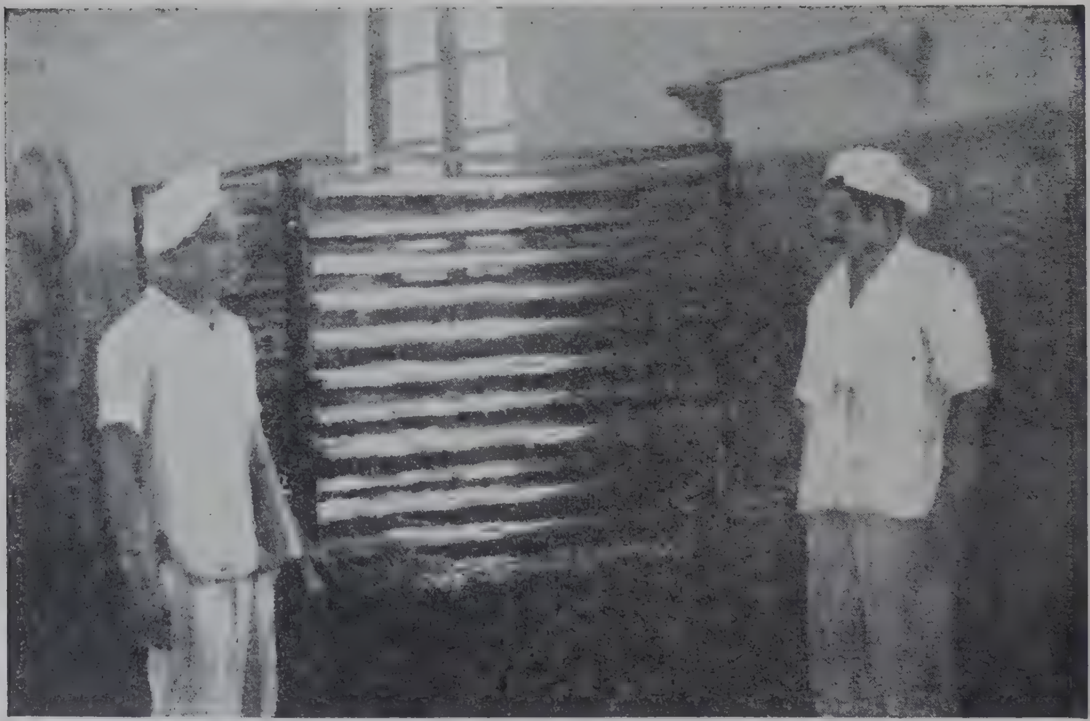
During the last World War II, the Department of Food sponsored a number of meat dehydration factories in India with a view to cater to the requirements of the Defence Services. Of these, factories at Nowshera and Delhi were under Government management while the rest were run by private contractors although Government owned. The dehydrated meat was goat's meat sliced and salted and while slaughtering care was taken to see that only healthy and well nourished goats not below 30 lb. live weight were accepted for this purpose. The statement below shows the location of the factory, number of goats slaughtered and quantity of meat supplied :

Name of the factory	Period	No. of goats slaughtered	Total quantity of dehydrated meat supplied to Q.M.G.	Total capital expenditure
			(tons)	(Rs.)
Agra	1944—46	123,499	360	664,215
Patna	Do.	166,016	405	805,714
Madras	Do.	344,882	332	589,377
Poona	Do.	487,517	496	924,946
Delhi	Do.	141,023	142	1,200,000
Anantpur	1945-46	110,826	115	
Panipat	Did not start.			
Amritsar	Do.			

Examination of age or disease (Ante-mortem examination)—
Meat Dehydration Factory—Delhi Cantt.

Deboning of meat before dehydration.

Traying of meat for putting into dehydration over.



Trollies carrying meat trays for dehydration.

The dehydration process adopted at all the factories was more or less as under:—

The goats after purchase and examination by a veterinary officer were kept in quarantine for 3 days. During this period they were allowed 4 lb. food per day and ample water. On the fourth day food was withheld but copious supply of water provided. After the animal was slaughtered, flayed and dressed it was weighed and passed on for deboning and removal of fat tendons, glands etc., etc. The meat was then cut into thin slices approximately 2 to 7 inches in length, 1 to 2½ inches wide and 1/6th to 1/8th inch in thickness. The slices were next brined in the 10 per cent saline solution for 3 minutes, spread out on trays and placed inside the dehydration tunnel for 8 to 10 hours with controlled temperature varying from 145° to 155°F. The dehydrated meat slices appearing as flakes were then packed in 3 lb. tins salted and sealed. Each tin was pierced to provide a small hole and kept in hot chamber (160°F.) for 3 hours, the expanded air in the tin escaping through the hole. On removal the holes were sealed and tins packed in Deal wool box—6 tins to a case. The entire process right from the slaughtering to the packing of dehydrated meat occupied roughly 22 hours.

The dehydrated tunnels used were forced drafts, counter-current and re-circulating type.

The cost of production was approximately Rs. 6-2-0 to Rs. 7 per lb. inclusive of the cost of packing in 4 gallon kerosene oil type tins. All the by-products such as skins, offals, etc. including intestines, udder, fat, etc. were sold to contractors. Kidneys, however, were separately dehydrated for supply to the British soldiers. All the above factories have since been closed down due to lack of civil demand.

The statement showing the proportion of dehydrated meat obtained from an average goat at various factories in India has been worked out and is shown in Appendix XIII.

It will be seen that in many advanced countries, there are three well-known methods for the preservation of meat and meat products, *viz.*, (*a*) Canning, (*b*) Dehydration and (*c*) Refrigeration. In the United States of America, these three methods are more of a co-operative nature rather than competitive. Each of these methods has its own merits. The establishment of a network of refrigerated transport in each case is essential. It may, however, be stated that dehydrated meat has its own limitations as far as consumers' preference for it is concerned. In spite of large scale development of dehydrated meat industry both in India and abroad, it has become obsolete due to lack of civilian demand. Canning alone remains the most popular method for the preservation of meat and meat products.

(4) CANNING OF MEAT

Meats are canned primarily for preservation without refrigeration and consequently majority are heated sufficiently high to sterilize them. Canning eliminates the necessity of rushing of entire stocks of meats to markets immediately after slaughter. Canned meats are very convenient and they add variety to the diet, making it less monotonous and more wholesome. They are vital offensive and defensive " weapons " in modern war as canned foods provide a supply for all emergencies and affect a saving in food, fuel, time and labour. Meat products are packed in lacquered and unlacquered cans, there being a difference of opinion as to which is preferable on hygienic grounds. Lithographed cans are often used to obviate labelling.

The development of a wide variety of canned meats in combination with vegetables and gravy is considered to provide a brighter future for the food processor. The new " Combination " meats have become quite popular in America and form something like 40 per cent of American canned meat trade. The State and Municipal agencies and the Federal Government through the Bureau of Animal Industry and the department of Agriculture exert a control on meat slaughter and processing and classify the grades of various meats. Great importance is given in the United States of America in educating the consumer to use more meat products to make up protein deficiency and mal-nutrition.

N.—Rules and regulations enforced for meat inspection and restrictions on slaughter of particular species of food animals

General

Disraeli has said " Public health is the fountain upon which rests the happiness of the people and the welfare of the nation ". The two activities of primary importance to any department of Public Health for ensuring the general well being of the people are the safeguarding of (*i*) water supply and (*ii*) food supply with special reference to milk and meat products. The inspection of meat and meat products is provided under the many municipal and food laws indicated by various provincial legislatures. The ante and post-mortem examination of animals laid down under these laws is designed to protect the public health, to ensure human methods of handling live-stock, to prevent unfair and discriminatory trading practices, at public markets and finally for protecting the citizens of the country from eating meat from diseased animals and for providing sanitary products to consumers. Rules and Regulations enforced for meat inspection in Bombay, Calcutta and Madras are shown in Appendices XIV to XVII.

The meat inspection work carried on in slaughter houses serves other purposes than that of inspecting and certifying slaughtering and processing operations. It is particularly valuable as an agency for collecting information for determining the extent and the regional location of certain animal diseases *e.g.*, tuberculosis and parasitic infections.

The system of meat inspection, however, as at present carried out in India with a very few exceptions is irregular, haphazard, perfunctionary and thoroughly unsatisfactory. Some of the striking anomalies and defects which call for immediate reform and improvement are :

(1) The country abounds in unlicensed and practically uncontrolled private slaughter-houses which is regarded as very unsatisfactory state of affairs by all those engaged in sanitary and public health work. Most of them are objectionably situated and cause much nuisance or else are unduly public. They lack even the minimum sanitary requirements and facilities for the inspection of the animals slaughtered therein, as also adequate lairage, lighting and hanging space.

(2) There is great diversity in the system of meat inspection throughout the country. Every meat inspection is a law unto himself. Tersely, it may be stated that there is complete absence of uniformity in the matter of meat inspection in this country.

In the matter of administration of these regulations the position is still more discouraging. In some of the municipalities where regulations do exist, no staff is employed to enforce them, and they are like so many arms collected without any soldiers to use them. In a majority of cases the men employed for meat inspection are Sanitary Inspectors who undergo a very meagre course of training before they are entrusted with the important duty of safeguarding public health in this direction. In most of the States this course of training runs over roughly a period of 6 months and meat inspection occupies only about 1/10th portion of the total training. No body can become qualified as a meat inspector by such a short course of instruction. At some places the duties of a meat inspector are left in the hands of the Inspector of Nuisances, a retired Jamedar of the Army or the Secretary of the Municipal Committee. Local medical and veterinary officers at other places work as meat inspectors. It will be observed that nearly every profession and trade is represented and it is left to each one to exercise his own opinion and to formulate the standard of inspection for the locality whose meat inspection he has charge of, and such a person has absolute control of the condemnations and passing of meat for human consumption. The whole system is most unsatisfactory and it will continue to be so until the authorities responsible for public health wake up and make legislation under which the standard of inspection could be improved and made uniform throughout the country. In sharp contrast to this, the U. S. regulations for meat inspection, as well as the inspection system in general, is far ahead of anything in existence in India. The Meat Inspection Regulations of the U. S. are not only designed to prevent the spread of disease and the infection of the consumer from the diseases carried by meat but are also designed to improve the quality and wholesomeness of the product. The Veterinary Officer not only has powers to condemn meat, but also the right to inspect and sample any meat product made in the plant at any time to determine if it agrees with the particular regulation laid down for that food item. Nothing like this practice is in operation in India to-day. The location of slaughtering plants, equipment sanitary arrangements, construction and general layouts, are all subject to the approval of the U. S. Bureau of Animal Industry. That such contrasts should exist would suggest that India is many decades behind the U. S. in respect of the inspection of meat.

It must be emphasised here that meat inspection is primarily veterinary function of public health and only duly qualified Veterinarians can do justice to this since the specialised course of training and the professional status of such officers provide the proper background and the necessary professional attitude to the responsible duty of inspecting meat.

Uniformity of practice and right decisions in meat inspection work also necessitate carefully formulated official regulations applicable with equal rigidity all over the country. Sanitary legislation in this direction in India is far behind that of practically any other country in the world, and whatever amount of it exist, is all in name and abortive in its practical utility. Very little progress in meat inspection can be expected until official regulations to control the work have been issued. Among other things a complete series of regulations should provide for :

(*a*) abolition of private slaughter houses ;
(*b*) licensing of slaughter houses and their proper construction ;
(*c*) the manner of conducting both ante-mortem and post-mortem inspections ;
(*d*) instructions as to action to be taken if unsoundness is discovered ;
(*e*) regulation to ensure that meat is produced, handled and transported in a cleanly manner ;
(*f*) control of meat shops, stalls and markets ;
(*g*) installations of cold stores in meat markets and slaughter houses ;
(*h*) regulations for keeping up-to-date records, etc. etc.

It is gratifying to note that importance of inspection on the above lines is slowly being realised in India as it is evidenced from the fact that recently the Indian Council of Agricultural Research has prepared a set of instructions for meat inspection as also model rules for the inspection of slaughter houses and their regulations *vide* Appendix XVIII. The memorandum emphasises that no person should be appointed a permanent meat inspector at any slaughter house unless he is a Veterinarian who has had sufficient course of training in meat inspection and it shall be his duties amongst others, (*i*) to attend at the slaughter house during the hours fixed, (*ii*) to carry out ante and post-mortem examination of animals intended for slaughter, (*iii*) to keep a record of the number and classes of animals slaughtered along with the number and kind of carcases, parts and organs condemned for different disease, (*iv*) to see at the close of each day's work that the slaughter house or houses under him are thoroughly cleansed and disinfected and the condemned parts and organs duly destroyed, (*v*) generally to enforce the provisions of slaughter-house rules.

It is very necessary that the model rules for meat inspection and for the inspection of slaughter houses and their regulations, are extended and made over comprehensive. Among other things these rules should provide that:—

(1) No person should be allowed to carry on the business of slaughter of animals and use any premises as slaughter house without a licence from the local authority.

(2) No person should slaughter or cause or permit to slaughter at any place other than a public slaughter house or premises licensed for the purpose of slaughtering, any four footed animal, the flesh of which may be used as human food, provided that this shall not apply for sacrificial slaughter, on the occasion of any festival or ceremony, of animals the flesh of which is not intended for sale, and provided further that slaughter of such animals shall not be carried out within the sight of public.

(3) The owner or occupier of every slaughter house shall cause to be maintained from day to day, a statement in a suitable record book or register showing clearly:—

(*a*) The number and kind of animals received into the slaughter house.

(*b*) Class, age, and sex of animals.

(*c*) Name and address of the butcher by whom animals are slaughtered.

(*d*) Fees recovered therefrom, and

(*e*) The results of meat inspection by the Veterinary Officer or meat inspector indicating grades, if prescribed, carcases rejected if any, etc., etc., and such record book or register shall be open to the inspection of the Medical Officer of Health, Veterinary Surgeon, or other person or persons authorised by the local authority in this behalf.

(4) No animals other than those intended for slaughtering should be allowed into the slaughter house and no animal be slaughtered in view of any other animal.

(5) No person affected with tuberculosis or any other infectious or contagious disease, leprosy, sores or any other skin disease shall enter the slaughter house. A periodical medical inspection of butchers, dressers, flayers, etc., shall be obligatory:

It is recommended that all the premier municipalities in India should give consideration to the proposals set out in above Appendix with a view to secure the observance of the highest possible standards of cleanliness and the segregation of sickly animals and of unsound and suspected meat.

It may be mentioned in passing that it is usual for meat inspectors particularly in town and city municipal areas to keep records of their findings and for medical officers of health to include in their annual reports summaries of statistics showing the quantities of meat rejected and the chief reasons for rejection. Such information can provide a useful record of disease in animals slaughtered for human consumption and can be used to indicate the incidence of disease in particular areas. The records must be accurate and they should be presented in standard form, so that records relating to different slaughter houses can be compared. The value of the existing records is much reduced because they are not comparable. It is, therefore, suggested that slaughter-house authorities should be required to cause records to be kept in a prescribed form relating to the inspection, seizure and disposal of condemned meat. These records should be open for inspection by the Health and Veterinary Departments. It is also recommended that provisions for the keeping of records should be applied by regulation in India and that the departments concerned should consider the form in which the records should be kept.

Restrictions imposed on the slaughter of particular species

There are certain restrictions imposed on the slaughter of cattle, sheep and goats in India with a view mainly to conserve the cattle wealth of the country. Aside this. in some predominantly Hindu areas like Rajasthan, Mysore, etc., slaughter of cattle is not permissible, while in States like Hyderabad and Bhopal, the slaughter of pigs is strictly prohibited.

During the last World War II, an acute shortage was felt of milch cattle and of work bullocks. This shortage arose as a result of the increased demand for milk and of the increase in areas under cultivation. At the same time it was observed that there was a decrease in cattle population by about 4 per cent*. There was therefore, evidently a need to introduce regulations that will ensure that this gap between availability and requirement is not widened. Since large scale slaughter was carried out by the military authorities, it was considered necessary to impose certain restrictions and the Government of India decided that the following categories of cattle should not be allowed to be slaughtered :—

(1) Cattle below 3 years of age, other than those which were unlikely to become useful draught, breeding or milch stock.

(2) Male cattle between 3—10 years of age other than those which were useless for draught or breeding.

(3) Cows between 3—10 years of age other than those which were useless for draught and breeding.

(4) All cows which were pregnant or in milk.

Under this prohibitory Order it was provided that any civil authority not below the rank of a Veterinary Surgeon would have the right of access to the military butchery and to object to the slaughter of any animal which in his opinion falls within the category prescribed. The State Governments (then Provincial Governments) were also later on addressed by the Government of India to introduce similar restrictions on civilian slaughters also. All the

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* Report of the Cattle Preservation and Development Committee, page 21.

States except one or two responded to this request, and under the Defence of India Rules issued Orders to that effect on the slaughter of cattle. At the expiry of the powers under the Defence of India Rules on 30th September 1946 the State Governments (then Provincial Governments) were asked to consider the feasibility of introducing legislation for continuing the restrictions imposed during war. In response to this request varied actions were taken by the different Governments. The Madras Government passed comprehensive Orders under "Madras Article Control and Requisitioning Act, 1946". The Bombay Government imposed restrictions on slaughter of young and useful cattle for a period of two years. Bengal Government did not enact any legislation because in their opinion cultivators did not slaughter useful cattle and because the demand from civilian slaughter houses had disappeared with the cessation of military demand. Assam, likewise, did not consider the necessity for the legislation in view of the return of that province to almost normal conditions. However, these restrictions have, since then, remained in force in one form or the other in most of the States

It will be seen from the foregoing that ample provision exists for the restriction of slaughter but there is no report available to show to what extent and with what effects these restrictions have actually been applied, excepting Bombay State where Government have appointed Veterinary Officers at 14 important slaughter houses like Ahmedabad, Bandra, Poona, Sholapur, etc. to see that the restrictions imposed are properly enforced. In addition to these restrictions, Bombay Government have also fixed weekly quotas of cattle, she-buffaloes, sheep and goats for about 73 slaughter-houses run by the various Municipalities and Cantonment Boards.

Many of the State Governments, with a view to meeting the local shortages as also conserving the stocks, observe certain day in a week as "Meatless day". On this day the slaughter and sale of meat is prohibited and no catering establishment is permitted to serve any dish or preparation containing meat. In some places "Animal Day" generally coinciding with "Kartik Purnima" is observed every year to show sympathy towards the animal world. On this day all the slaughter houses remain closed and no meat is allowed to be sold.

More recently the Government of India set up the Cattle Preservation & Development Committee which has recommended that cattle slaughter should be banned completely and steps taken to improve the cattle which are in a deplorable condition at present. To achieve these ends, the Committee has suggested :—

(a) The prohibition of slaughter of useful cattle with immediate effect.

(b) Enactment of legislation for prohibiting slaughter of cattle as early as possible and in any case within two years during which period arrangements for maintenance and care of unserviceable and unproductive animals should be made.

The Ministry of Agriculture have also circulated a draft bill to all state governments, the purpose of which is to prohibit the slaughter of useful cattle. It is pointed out that the Central Government has under the Government of India Act, 1935, no jurisdiction to legislate on the subject of cattle slaughter, which is a provincial subject.

The draft bill provides that no person can slaughter an animal unless he has obtained a certificate in writing to the effect that the animal is fit for slaughter duly signed by the President of the Municipality or his nominee and the Veterinary Officer for the area, in which the animal is to be slaughtered. Such a certificate can only be issued if both the President and the Veterinary Officer agree that the animal is over 14 years of age and unfit for work or breeding, and that it is permanently incapacitated from work

All offences under the Act will be cognizable and contravention of any of its provisions will be punishable with imprisonment for a term up to six months and fine up to Rs. 1,000 or with both.

The Government of Bombay and many other States, with a view to conserve the cattle wealth of the State have decided to prohibit the slaughter of animals which are useful for milch, breeding or agricultural purposes. The Bombay Animal Preservation Bill which has been prepared to secure this object makes it an offence to slaughter any animal without a certificate from a Veterinary Officer. A certificate will not be granted if the animal is young or useful for milch, breeding or agricultural purposes. Offenders will be punished with imprisonment for a term which may extend to six months or with a fine which may extend to Rs. 1,000 or with both.

The West Bengal Government has taken a similar action and passed the West Bengal Animal Slaughter Control Bill (1950) to control the slaughter of certain categories of animals *vide* Appendix XVII.

O.—Government measures affecting meat in certain countries*

While on this subject, it may be useful to examine what action was taken by other countries in regard to this matter, as also various Government measures affecting meat in certain countries like Burma, United Kingdom, United States of America, etc. etc.

Burma during the war was confronted with a situation similar to that in India and issued an Act entitled "The Cattle Slaughter Prohibition Act of 1947". Under this Act no cattle other than the following can be slaughtered.

(1) Cattle required on the occasion of any religious festival or ceremony and subject to what is strictly necessary for such purposes.

(2) Cattle needed to meet the beef requirements of the Burma Defence Forces subject to the production of indents from competent military authorities to ensure that cattle slaughter is not in excess of actual requirements. Such slaughter shall be confined to cattle of the following categories only :—

(*a*) *Males.*—Males over 14 years of age and unfit for work and animals of any age permanently unable to work owing to injury or deformity.

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* *Source* :—Information extracted from Commonwealth Economic Committee Publication "Meat", 1948.

(b) *Females.*—Permanently unfit for work owing to injury or deformity.

(3) Seriously injured cattle as an act of mercy in order to put the animal out of agony.

It will be seen that the Burma Regulations are more or less similar to those in India; if at all they are more rigorous and prohibition is extended over a wider range of cattle than that done in India. The penalty for the infringement of these restrictions is imprisonment extending up to 6 months or with fine or with both.

During the World War II, in the United Kingdom, the Ministry of Food became the sole buyer of cattle, sheep and pigs for slaughter for human consumption and of imported meat, including bacon and ham. Under the Government's concentration scheme, the 250 public and 16,000 private slaughterhouses were reduced to less than 600 operated by, or on behalf of, the Ministry of Food. The Ministry of Food imported meat and bacon from Argentina, New Zealand, Canada, etc. The bacon and meat rationing was introduced in the United Kingdom in January 1940 and March 1940 respectively.

In Australia during the war, the Australian Meat Board and the meat industry as a whole became subject to Government control under National Security Regulations. Only after the war, the meat trade between the United Kingdom and Australia was resumed under bulk purchase agreements.

The New Zealand Government at the outbreak of war, entered into the first bulk purchase agreement with the United Kingdom. The internal arrangements for the export of meat were undertaken by the Marketing Department of the New Zealand Government, the Meat Producers' Board and the Freezing Companies. The Marketing Department paid to exporters the fixed f.o.b. price agreed under the contract, less ½ per cent deducted for expenses.

To restrict local consumption and make available for export, rationing was introduced in March 1944.

At the outbreak of the war, the Canadian Government established the Agricultural Supplies Board, with authority to buy, sell, store and regulate the distribution of agricultural, livestock, dairy produce, etc., etc., and recommend licensing of exports. Later on Meat Board was established, this board arranged for shipments under the contracts and payment to the packing companies for exported meat. Rationing was introduced in 1943 and again in September 1945, consumer rationing was resumed in order that contract commitments to the United Kingdom might be fulfilled.

In the United States of America during the war, the control of meat was taken over by the Government and allocations for export and military requirements were secured both by restricting consumption and by increasing production. Rationing was introduced during the year 1942 and ended during March 1947.

CHAPTER IV—ASSEMBLING AND DISTRIBUTION

General

Assembling and distribution comprise the two most important phases in the marketing of agricultural commodities. The expenses incurred, the time involved, the risks hazarded and profits made by the agencies connected with these two services, largely determine the share which the producer receives out of the price by the buyer or the consumer. In this country the problem is of special importance owing to small scale and much too scattered production, with the result that a number becomes necessary, which tend to reduce the price received by the producer and to increase that paid by the consumer.

The problems of assembling and distribution which confront the meat trade are greatly dissimilar to those prevalent in case of other agricultural commodities. The perishable nature of meat and the fact that due to religious scruples, only the butcher class mostly from Muslim community deals in this business, however, have given a special colour to this trade which is not found in the case of some other commodities. The primary producers of meat are not only extremely poor but also backward and illiterate. Their intelligence and ambitions are limited and their financial conditions prevent them from accumulating any stocks or waiting for a better turn in the markets. On this account the production takes place not only on scattered and small scale but also in a casual and irregular manner. The butchers, therefore, follow obsolete traditional practices and show little inclination to make improvements or to strike new paths. Their activities are limited and characterised by a lack of enterprise. Even in routine matters there is the same aversion to progress.

The producers or butchers in urban areas are decidedly better placed because of their touch with the dealers and other operating on behalf of larger commission agents, tanners and shippers. This enables them to take advantage of the favourable trends in the market as compared with the rural producers but even they, with limited intelligence and capital cannot afford to arrange efficient cold storage or provide refrigerated transport facilities which are the primary and most essential requirements of the meat trade. Thus an organised and large scale assembling and distribution of meat does not take place even at important markets by merchants who possess foresight, acumen and proper finance. It is, therefore, that the meat industry has remained undeveloped and unorganised upto the present day in spite of meat being an important commodity. Unless the poverty of butchers is removed and their conservative outlook changed the system of assembling and distribution of meat is not likely to improve substantially in the near future in this country.

A.—Agencies engaged and their methods of assembling and distribution

The meat trade in India is practically monopolised by Muslims belonging to a hereditary class of people called "*Kassais*". Among the Hindus and Sikhs the profession is adopted mostly by *Kalas*, *Jatias* and *Meghwars* as also by *Jhiwars* or *Mehras* (water carrier caste). Broadly speaking, in rural areas there are only two agencies, namely, (*a*) private producers and (*b*) butchers who engage themselves in production and distribution of meat.

Private producers who may be agriculturists, artisans, labourers or menials produce meat mostly for their own consumption, more generally on special religious or social occasions such as, Id-ul-Zuha, Holi, marriage or birth of a son, etc., etc. Sometimes an animal about to die may also provide an occasion for the production and consumption of meat in a village. These private producers generally slaughter the animals with their own hands, in some cases get them slaughtered by professional or special men on payment of a small fee.

A good deal of meat in rural areas, however, is prepared by the professional butchers. They are of two kinds, (*i*) for cattle and (*ii*) for sheep and goats. In some of the larger villages an animal or two (cattle) may be slaughtered daily or every alternate day, but in the smaller ones the slaughtering is generally a weekly affair. In case of sheep and goats also, not very many animals are slaughtered every-day but during certain festivals such as Id-ul-zuha, the production of meat in some villages increases considerably because of '*Qurbani*' (sacrifice) on these occasions. In handling slaughter livestock, the most common procedure is to buy the animals from farmers or dealers, slaughter them and sell their meat in retail direct to consumers. In a few cases some butchers advance money to village *beoparies* who go round the villages in their respective areas, collect cattle, sheep and goats from the villages and supply them to butchers charging their own commission.

Urban areas.—In highly concentrated areas like those of Bombay, Calcutta, Madras, etc., bulk of meat is produced by professional butchers and they constitute the most important link in the chain of agencies engaged in assembling and distribution of meat. The bulk of the animals are obtained at Sheep & Goat Markets, mostly by private negotiation. Beef cattle is dealt in much more through weekly markets than other kinds of stock. Pigs are as a rule marketed direct to butchers in larger proportion than other slaughter livestock. In cases where animals are bought in country side through country dealers, it is customary to make small down payment called "*Soothe*" (advance) at the time of purchase in order to make the deal binding. The number of animals handled by each butcher, varies considerably and generally ranges from 1 to 10 heads in case of cattle and 5 to 50 and sometimes more in case of sheep and goats. As a rule each butcher produces meat for the requirements of his own retail shop and after preparing the meat in the slaughter house takes it to his stall for sale to the consumers.

There has been a tendency in some places for the retail dealers of meat to buy their meat in the wholesale market instead of buying the animals for slaughter. The wholesale and retail distribution of meats are usually carried on as separate business, although, to a limited extent, the two are found to be conducted by the same individual. By wholesale distribution is meant that sale of products is relatively large volume, the sale being made to retail dealers, who, in turn, sell in small quantities to consumers. Meats generally bought for consumption in hotels, restaurants, hospitals, messes etc., are retained in wholesale because the supplies needed are relatively large.

It will thus be seen that butcher's requirement of food animals is fulfilled in the following three ways:—

(*a*) By direct purchase of live animals in a market either by private treaty or at auction;

(*b*) By purchase through a dealer and

(*c*) By purchase of carcase or carcases from a wholesale meat market according to individual requirements.

The purchase of dressed carcases by retailers is almost entirely confined to the large towns. To the retailer whose trade in meat is relatively small, the purchase of carcase meat in wholesale markets represents a considerable saving of time, trouble and expense, but their number is relatively small. Buying animals on the hoof, on the other hand, enables a butcher to use his experience, judgement and business ability. It eliminates the services of at least one intermediary between himself and the producer or the merchant. Many butchers, therefore, prefer to buy, slaughter and dress their own stock rather than rely on the wholesale meat markets for their supplies.

There are thus only three well defined agencies engaged in the assemblying and distribution of meat. The *beoparies* procure live animals and supply them to butchers whereas, both wholesalers and retailers, take up the distribution of meat to the consumers direct.

It is rather difficult to say exactly the percentage share of different kinds of meat handled by each of the above agencies, for, it should be noted that butchers are divided into a number of groups and each group deals in particular type of meat.

B.—Markets (types, construction, design, plans, ownership, control, facilities, etc. of slaughter-houses and meat markets).

A market is defined to be a public place used for the purpose of buying and selling. Generally speaking, markets are of two types, (*a*) permanent and (*b*) temporary. Permanent markets are those where business transactions are carried out from day to day while the temporary ones may be weekly, bi-weekly, casual or occasional, mostly held in connection with one or the other annual fair, festival or shandy day. Permanent markets are further sub-divided in urban and rural markets.

Urban markets.—Urban markets are daily markets, usually situated in the district towns, important trade centres or near railway stations. Both assembling and distribution of fresh meat takes place in these markets. These markets are generally all *pucca* built with solid walls, covered roofiing, impervious flooring, light, water and

Old and useless bullocks for slaughter at Bandra Slaughter House—Bombay.

Sheep and Goat Market—Bandra Slaughter House—Bombay.

drainage provided. In almost all these markets special sections are provided for sale of beef, mutton and pork. The markets vary considerably in size and layout. The design is generally on the lines of big rectangular hall with stalls provided in the centre and sides, each one separated from the other by about 3 feet space. The stalls vary in size from market to market but generally they are raised platforms some 3 feet above the ground and 4 × 4 ft. with iron hangers fixed on a pipe running at the top. The stalls are made of cement or glazed white tiles with marble slabs on top. In some places wooden tables with zinc sheet tops are used for this purpose. Some of the markets are also provided with wire-gauze doors and windows to keep off the flies, crows and vultures.

Rural markets.—In rural areas there are no properly built markets. Ordinarily some old dilapidated shops or building, even a disused compound is used for this purpose. The stall, at which meat is sold generally has a stand which consists of a narrow wooden box, like platform, with two upright posts, banded square, pinned or nailed to the back. Connecting these posts are two or three bars bristling with wrought nails which serve as meat hooks. These premises as a rule have no proper arrangements to keep the meat under hygienic conditions, very often the carcases are found to be hanging fully exposed to dirt, flies, etc.

Abattoirs or slaughter houses are establishments where animals are slaughtered for human consumption. A slaughter house may be either a public slaughter house maintained by local authority or a private slaughter house licensed or unlicensed for the purpose of slaughtering animals. Public slaughter houses are open to all those who wish to slaughter animals for human food.

Generally speaking, these slaughter houses are located on the outskirts of cities and towns and in certain areas the slaughter houses for (*a*) cattle and (*b*) sheep and goat, are separately provided. They vary in size from those killing only a few hundred heads per annum to those with a total yearly kill of 100,000 or more animals. The majority, however, are in the 500 to 5,000 category.

Some of the slaughter houses particularly owned by big municipalities are fairly well built with fly-proof room and glazed tile floors and walls for hanging carcases. But the condition and facilities at individual slaughter houses vary considerably and a large number are in greater or lesser degree inadequately constructed and equipped.

In many of the slaughter houses, hardly any facilities exist for hoisting the carcases; and there is no separate hanging room for dressed meat and offals and at many there is inadequate space for inspection of meat. Steam or hot water arrangements for the sterilisation of equipment are not available in any of the slaughter houses. In short, in many of the slaughter houses used at the present time physical conditions fall far short of the minimum standard necessary for the effective inspection of meat and for the observance of reasonable standards of cleanliness.

The table below shows the number of recognised and unrecognised slaughter houses.

TABLE No. XXV

Table showing the number of recognised and unrecognised slaughter-houses in India (1948-49)

	Recognised	Unrecognised	Total
Ajmer	7	..	7
Assam	10	276	286
Bihar	..	..	65
Bombay	6	67	73
Coorg	6	7	13
Delhi	3	..	3
Himachal Pradesh	4	..	4
Hyderabad	..	..	125
Kashmir	..	29	29
Madras	114	364	478
Madhya Bharat	..	4	4
Madhya Pradesh	..	..	289
Mysore	39	43	82
Orissa	5	15	20
PEPSU	10	50	60
Punjab (I)	4	119	123
Rajasthan	5	13	18
Saurashtra	..	..	14
Travancore-Cochin	36	28	64
Uttar Pradesh	28	296	324
Vindhya Pradesh	..	..	5
West Bengal	12	55	67
Others	..	..	12
Total	289	1,366	2,165

It will be seen that the number of slaughter houses, both recognised and unrecognised in India in 1948 was roughly 2,165. Of this the largest number 478 was in Madras, followed by 324 in the Uttar Pradesh and 289 in Madhya Pradesh. Hardly 15 per cent. of the slaughter houses (289 in number) are being inspected by Veterinary Officers.

The two main slaughter houses designs that are in vogue are (1) the open hall system and (2) the booth type. The former is the one more generally adopted in this country and consists of a large rectangular enclosure bounded by four walls, without or with roofing covered with mangalore tiles, corrugated or asbestos sheeting. They generally have sloping cement flooring and open drains which facilitate proper washing and cleaning. A cast iron pipe frame with hooks is provided on either side for hanging of carcases. In some places conveyors and mechanical hoists with chains and pulleys working on trolleys are provided for carriage of heavy beef carcases.

Meat markets and slaughter houses are usually provided, owned and controlled by local authority, *e.g.*, Municipality, Local Board, Cantonment, etc., in whose jurisdiction they are situated. These local authorities are responsible for certain essential services, such as cleansing, water, provision of light, etc. the revenue being derived from stall rents, slaughter fees, transport charges, etc. Though the flooring, drainage and other sanitary conditions are fairly satisfactory in some of the slaughter houses owned by big municipalities like Bombay and Madras, still the maintenance of sanitation and arrangement for washing, water and light, etc., in most of the other markets and slaughter houses leave much to be desired. Under the Municipal and District Local Boards Act, there is ample scope for the local bodies to control effectively the production and sale of meat in their areas. Certain provisions are made for seizure and destruction of unwholesome articles of food and various fines and penalties are prescribed for breach of the rules but in actual practice, these rules and regulations are, however, honoured more in breach than in observance.

The rural markets are either owned by District Boards or Zamindars. They generally charge a fee from all persons operating in these markets. As a rule, the right of collecting the market fee is leased out on yearly basis but the contractor has to abide by the rates fixed by the owner. The conditions in the rural markets are far more worse, nay shocking, there being no control whatsoever on slaughter, or sale of meat.

It may be observed that most of the meat is purveyed and distributed through open and ill-equipped meat shops or stalls, exposed to all contamination, like dirt, flies, crows, vermins, etc. A major factor in securing hygienic conditions during storage and sale is the suitability of the premises. They should be adequately ventilated, well lit, capable of being easily cleaned and adequately protected against vermins and flies. It is strongly felt that all purveyors of butcher's meat for food should be registered with the local authority which should be authorised to make regulations as to the sanitary conditions and cleanliness of premises used for the storage and sale of meat and of the appliances used therein and for the prevention of the contamination of meat. It may also be stated that suitable premises and equipment are only a part of what is needed to safeguard public health. The day-to-day conduct of the business, the practice of personal hygiene, and the maintenance of cleanly conditions are of even greater importance. It is, therefore, suggested that the sale of meat from such stalls should be as far as possible, brought to an end. The shops should be subject to registration by the local authority of the areas from which they operate and that registration should be conditional upon approval by the local authority of the construction and equipment of these shops and of the accommodation for the storage of meat.

So far as the slaughter houses are concerned, it won't be an exaggeration to say that the typical Indian slaughter house is small and highly insanitary, and on the whole a disgrace to the municipality who generally owns and looks after it. Apart from the fact that flooring, drainage, water supply and lighting are invariably bad and defective, there is no provision for protection from crows, vultures, dogs, etc., etc. More often than not, the so-called slaughter house is only an open courtyard without pavement of any kind. The animal to be killed is dragged to the place when others are lying slaughtered or are about to be slaughtered. Hardly any facilities exist for hoisting the carcases and handling and the slaughtering facilities are extremely poor, compared with the highly mechanised and efficiently operated American abattoirs. Enclosed booths for slaughter, storage facilities and cooling rooms, unlike foreign countries are practically non-existent in the premises of slaughter houses. The question of improving the present city slaughter houses or replacing them with modern types should receive special attention.

In a tropical country like India, bacterial deterioration sets in at a rapid rate in meat and it is, therefore, desirable that at least a few important slaughter houses should be equipped with cold storage facilities on scientific lines so as to enable the trade to utilise the meat by-products which now go to waste. A most desirable arrangement in abattoir or slaughter house lay-out is one by which the live animal enters at one end of the slaughter house, the finished product leaving at the other end, with the whole process working in one direction. In a modern slaughter house the following buildings must be provided : (1) Lairage, (2) Isolation Block, (3) Slaughter Hall, (4) Cooling Hall, (5) Hide and Skin Store, (6) Guttery and Tripery and (7) Offices and condemned meat room.

The other essentials of a modern slaughter house are as under :—

1. The premises to be erected or to be used and occupied as a slaughter house should not be within 500 yards of any dwelling house or building frequented by the public, and the site should be such as to admit of free ventilation on at least two sides of the slaughter house.
2. Every slaughter hall or cooling room should be covered with a proper roof which have means of thorough ventilation and adequate light, both natural and artificial.

3. All lairs, pens or stables provided for food animals should be properly paved, drained, ventilated and lighted and water supply in them should be convenient and adequate for animals awaiting slaughter and they should be so situated or constructed that animals within them may not be able to see into slaughter hall or cooling room.
4. The slaughter-houses should be well paved with rough cement concrete or other non-slippery impervious material and laid with proper slope and channels running towards one or more gullies placed immediately outside the slaughter hall to allow of the floor being flushed and drained. Adequate number of hangers or pulleys for hanging the carcases and facilitating the dressing of the slaughter animals should be provided. For non-sewered towns a cesspool or pit constructed of non-absorbent material should be provided outside the building for the collection of slaughter house refuse.
5. The surface of the walls in interior of the slaughter-house should be covered with hard, smooth and impervious material, preferably white glazed tiles to a height of at least 6 feet. White-washing of the walls should be done at least once in six months at places where no impervious material is used as covering for the interior surface of the walls.
6. The water supply should be ample, clean, and portable with adequate facilities for distribution in the slaughter-house.
7. Every practicable precaution should be taken to keep the slaughter-houses free from flies, carrion, crows, cats, dogs, rats, mice, and other vermins. All doors and windows should be provided with fly-proof shutters.
8. Every slaughter house should be provided with properly located facilities for disinfecting and cleaning utensils, hands and instruments etc. of all persons handling any meat or meat products.

It might be stated that in U.S. and other advanced foreign countries the meat plants are generally multi-storey buildings with up-to-date mechanisation and refrigeration facilities, which serve as a 'cushion' between supply and demand. Factory output in U.S. compared with that of largest slaughter house in this country, is enormous, one of the largest plant, killing as many as 8,000 pigs a day. Pigs and other food animals are driven to the top floor up a series of ramps and in some cases carried up in lifts. It was normal after the pigs had been penned to shower them with cold water from sprays fixed to the ceiling. This cooled them rapidly after their climb and obviate any pre-slaughter rest period. As a rule a meat-packing plant in U.K. or U.S.A. consists usually of holding pens or shelter sheds; a killing floor on which the stock is usually both dispatched and dressed, a refrigeration chamber for removing body warmth from the meat; various chilled workrooms for cutting the carcase into trade cuts; specialised rooms for such operations as curing, sausage making, smoking, etc. In addition, the meat-packing plant is likely to have associated with if facilities for the manufacture of lard, tallow, and other fat products ; gelatine, glue, animal feeds and other secondary by-products as well as facilities for the handling of such items as hides, skins and pelts. Also there are such important units as an adequate steam-plant power plant, refrigeration plants, chemical control laboratories, etc. A few of the national or big companies usually have well-staffed research laboratories which are essential units for progress.

C.—List of important meat markets with quantities of meat of different kinds handled annually.

Meat production is mostly concentrated in urban areas and quantity produced and handled at a centre is generally proportionate to its meat eating population. From the records of animals slaughtered, maintained by various municipalities, the quantity of meat produced at a centre can be estimated in respect of cattle, sheep and goats only. The slaughter of pigs is usually not recorded at most of the places. Appendix XIX gives a list of important meat markets with approximate quantities of meat of different kinds handled annually.

During recent years there has been some increase in the volume of supplies to Bombay, Madras, Calcutta, etc., but the population of the cities have also increased very considerably during the last decade. As a result of prohibition on slaughter of cattle in some places, the beef supplies have completely fallen off and instead mutton, goat flesh and even pork supplies have considerably gone up just in case of Delhi.

The present survey has also disclosed that markets are generally under-supplied almost everywhere. The low *per capita* consumption figures worked out for different areas also show the inequality of consumption.

D.—Market charges (including octroi, market fee, slaughtering and flaying charges, brokerage for selling meat (not live animals), rent of meat stalls, etc.)

These are the charges for services rendered both at the markets as also at the slaughter-houses, and amongst others include octroi, market fee, slaughtering, flaying and transport charges, rent of meat stalls, etc., etc. There is, however, no uniform basis of levying the charges. These charges vary from market to market and place to place and in almost all cases a fairly large percentage of these go to the municipality, Cantonment or Local Board owning the market or the slaughter-house.

The details of the market and slaughter-house charges in force in important centres are shown in Appendix XX and are briefly described below :—

(*a*) *Octroi charges.*—Octroi charges are generally not levied on meat in this country as most of the slaughter-houses are invariably situated within the municipal and local board limits and fresh meat is not ordinarily imported from one town or district to the other. However, in some places like Ajmer-Merwara and Sambalpur in Orissa, octroi charges varying from 1 pice to 1½ pice per seer mutton or beef are charged. The octroi charges are as a rule levied on live animals whether intended for slaughter or otherwise as soon as they enter municipal limits.

(b) *Market fee.*—This is the fee which is payable in the market or "*Piri*" where animals are assembled. This fee is generally paid by the buyers.

The charges vary from place to place within a range of 3 pice to 2 annas per head of sheep or goat and from one anna to four annas per head of oxen or buffalo. In some places like Madras this fee is collected by a contractor to whom the right of collection is leased out on yearly basis.

(c) *Slaughter-house fee.*—This is a prescribed fee which is levied by the local boards or the municipalities on the slaughter of food animals in the recognised slaughter-houses. It varies from two annas to ten annas or even upto a rupee in certain cases. At places like Bombay, Bangalore, Calcutta, Madras, etc., slaughter fee also includes the conveyance charges of meat, from slaughter-house to a market which is provided by the municipality concerned. In Bombay, slaughter fee for buffalo is Rs. 15 per head and out of this amount Rs. 5 is retained by Kurla municipality (slaughter-house is owned jointly by two municipalities) and the balance is paid into the Bombay municipal treasury. In Delhi, no market fee is charged but in lieu "*Rewati*" (profit for selling meat at the slaughter-house) is charged at the flat rate of Rs. 2 per beef carcase and 12 annas for sheep and goat carcases. Now, however, there is no slaughter of beef cattle in Delhi.

In rural places no slaughter fee is charged as proper facilities for slaughtering of animals do not exist in those areas.

(d) *Flaying charges.*—At places where a small number of animals are slaughtered no flaying charges are paid as this work is done by butchers themselves. Where, however, a large number of animals are slaughtered daily, professional flayers are engaged and their charges vary from one to two annas per sheep or goat and from 8 annas to Re. 1 per head of cattle. These variations in the charges largely depend on the number of animals flayed and the availability of labour in that area. In some places a "*Mulla*" (Priest) is engaged specially for cutting the throat of the animals. He is paid anything from 3 pies to an anna per sheep or goat and 2 annas to 4 annas, sometimes even more, for bull, bullock, cow or buffalo. Sometimes a few flayers combine together and engage a *Mulla* on monthly basis, each contributing 4 to 5 rupees per month towards the pay of the *Mulla*.

In a few places, notably in Uttar Pradesh, the flayers instead of being paid in cash are paid in kind and they are allowed to cut a portion of flesh called "*Botee*" from neck or belly in case of the beef cattle to the extent of 2 to 3 seers per animal. In the case of sheep and goat the flayer gets the foreleg or the head of the flayed animal.

(*e*) *Brokerage.*—Brokerage is seldom paid in any meat transactions. The sales are directly conducted by the butchers themselves and therefore the question of brokerage ordinarily does not arise. In Bangalore, beef animals are not allowed to be slaughtered but carcases are imported from Madras and a brokerage of roughly one anna per lb. is charged by wholesale dealers.

(*f*) *Other charges.*—Apart from the above sometimes in some places a charity charge is levied for the maintenance of mosques, schools, etc., in the case of Muslim butchers. The deductions are generally fixed and vary from 1 piece per sheep or goat to 1 anna to 2 annas per horned cattle.

(*g*) *Rent of meat stalls.*—The rent of meat stalls varies from place to place, largely depending upon the importance of the place, location of the market and the type, size and position of the stall. Prominent and corner stalls near the entrance usually fetch about 25 per cent. extra. The rents per stall at Bombay vary from Rs. 60 to Rs. 200 per quarter, while at Lucknow and Allahabad they range from Rs. 24 to Rs. 72 per annum. In Sir Stuart Hogg Market, Calcutta, there are different rents for different types of meat stalls and the schedule of their charges is as under :

	Rs.	A.	P.	
(i) Table in the corner position	1	14	0	per day.
1st class table	1	8	0	per day.
2nd class table	1	4	0	per day.
3rd class table	0	12	0	per day.

In each of the aforesaid tables, four carcases are allowed for sale. Extra charges are levied for additional carcases, if any.

(ii) *Mutton stalls* —

	Rs.	A.	P.	
Table in the corner	1	8	0	per day.
Other tables	1	4	0	per day.

In each of the aforesaid tables, 10 carcases are allowed for sale.

In some markets as in Calcutta, Hyderabad and Bangalore, in addition to the meat stalls there are daily " sittings " for sale of offals, etc. and the rent charged varies from three annas to eight annas per diem. In Arthur Crawford Market, Bombay, rents vary from Rs. 90 to Rs. 100 per stall per quarter. Generally, the rents are collected either monthly, quarterly, half-yearly or yearly in advance. In some places, the right of collection of rents for allotment of stalls and sittings, etc. is leased out in open auctions, to the highest bidders on yearly basis.

Apart from these recognised meat stalls in Municipal markets, private butcher shops are allowed to function in some of the towns and the stall rents in their case varies from Rs. 5 to Rs. 30 and sometimes even more per month.

Some municipalities also levy trade license fee. All butchers, flayers and others have to take different licenses according to the rules in force in municipalities, etc. before they could operate in markets or slaughter-houses. The license fee varies from Re. 1 to Rs. 12 per annum.

In Bombay, the licensed flayers are called "*Kamatries*" and their assistants "*Helkaries*" and they help in the whole process of flaying and dressing of carcases.

E.—Handling and Transport

(1) HANDLING

(a) *Methods of handling.*—Proper handling of meat is necessary to make it into sound and palatable product that will help satisfactorily. Fresh meat being highly perishable, its proper handling and transport become all the more necessary to clear the supplies quickly. As a rule butchers endeavour to dispose of their meat as soon as possible after slaughter. This practice is followed not only because meat kept as it is at present tends to deteriorate in appearance but also because of shrinkage, *i.e.*, loss of weight through evaporation of water. Some shrinkage in weight inevitably occurs to meat during transit. If carcases are transported quickly, relatively little shrinkage is likely to occur, loss of weight is naturally caused through delay. Inferior carcases tend to shrink more than better quality animals and young carcases more than old ones. The extent of shrinkage, or the loss during transit largely depends on the state of weather and the mode of transport. Hot weather or a strong drying breeze passing through a slaughter-house will naturally promote evaporation, in cold weather the shrinkage will be less. Figures are difficult to obtain but the shrinkage in weight of carcases in transit, for instance between Bandra Slaughter-House and Crawford Market, Bombay (a distance of 14 miles), has been estimated to be 4 to 8 lb. per beef carcase.

Additional shrinkage or loss in weight takes place in cutting, trimming, preparing the meat for retailing, etc. The shrinkage or waste is relatively greater for beef than for other meats, because more of the meat is boned.

In some of the recognised slaughter-houses in urban areas, the general practice is to have beef killings in the evenings and sheep and goat slaughterings early in the mornings. After a beef carcase has been slaughtered, flayed and dressed, it is cut into sides and quartered like the fore and hind, and passed on to the hanging rooms wherever they exist in order to allow the animal heat to escape. Here the carcases remain for a few hours and by about midnight they are placed in meat vans and taken to various markets for sale on the following morning. In sharp contrast to this, the mutton and goat carcases, as a rule, are neither cut nor hung for any length of time. In rural and other areas the carcases usually pass direct from the killing floor to the meat markets or butcher shops for retail sale.

This happens because the hanging facilities are insufficient in most of the slaughter-houses in this country with the result that the meat has to be taken away at once to the shops or meat markets, often before the carcases are properly set, because there are no means of keeping him elsewhere. Both, absence of resting before slaughter and movement of carcases before setting are injurious to the meat. It may, however, be stated that all meats does not benefit equally by handing. Broadly, it is not necessary to hang high quality meat from young and stall fed animals so long as that from more mature beasts and it may not be advisable to hang inferior meat from animals in poor condition. The bulk of meat, however, lies between these extremes and would, in general, benefit greatly by hanging.

No particular or specially designed containers are used by the butchers in handling and transport of meat, because carcases are invariably carried loose from the slaughter-house to the assembling market. In some cases where baskets are used as containers, they are generally made of bamboo, cane, wicker, mulbery or some other fibre twine. They are of various dimensions commonly 3 to 4 ft. in diameter, holding half to one and half maund in weight. Each basket costs anything from rupee one to three, sometimes even more depending upon the capacity, type and material used.

It cannot be seriously maintained that the meat supplies taken as a whole are handled as efficiently as the meat supplies of some overseas producers, with their up-to-date plants where nothing is wasted and from which all supplies reach the consumer in the best possible condition. This inefficiency and a serious waste of by-products are inevitable so long as slaughtering is diffused over numerous small units possessing a diversity of skill, varying accommodation and equipment and, in the case of small butchers, no opportunity of acquiring the high degree of technical proficiency which the continuous work of a factory ensures. High output in this country thus, is often restricted by lack of mechanisation and by the poor layout of slaughter-houses.

(b) *Loss through faulty handling.*—Following production, meat may receive further contamination at any stage of its handling in the slaughter-house and during its journey from there to the distributor or to the consumer, depending on the cleanliness of the container used for handling meat, conditions of transport, and atmospheric temperature, humidity etc. The butcher in his turn by the use of dirty hands. knives and cutting instruments can add considerable contamination to the meat. Finally, the consumers are not always free from blame in this respect. Dirty receptacles and unsuitable storage places add a fresh quota of organisms. The practice of leaving meat uncovered, to be contaminated by flies, is too common and is often a source of disease of infection. The extent of such infection depends on the standards of hygiene and amount of care exercised in the production and handling of meat. The contamination is generally higher in summer than in winter.

When meat "goes bad" it gets slimmy or sticky, turns dark brown and develops an unpleasant taste and smell. These changes are due chiefly to the growth of moulds and bacteria on the surfaces.

Bacteria are invisible when growing singly, but when large numbers are clumped together they can be seen as creamy or brownish droplets, which grow together to make a slime over the outside of the meat, specially the lean. Moulds make a fur on the meat which is most often white or green.

After an animal is killed, flayed and dressed, the carcase must be allowed to cool off. It is at this point that the very greatest care should be exercised if it is to retain its keeping power and a good appearance. Most of the loss occurs at this point through slaughterman failing to exercise due care or through inadequate facilities being provided at slaughter houses for the purpose. It is essential that the animal heat should be allowed to escape before the carcases are transported to meat markets. Losses and depreciation in the supplies through bad handling and transporting are stated to be sometimes serious and butchers would do well to give attention to this matter. It has already been said that meat in this country is not transported over long distances. On this account the loss through faulty handling is not very high. This also happens only in cases where carcases are either improperly flayed and dressed or roughly handled and dumped one over the other. Due to this rough handling certain portions of the carcases get bruised with the result that bacterial deterioration sets in quickly and flesh becomes unfit and unwholesome and ultimately is not allowed to be sold for human consumption. The cutting waste and shrinkage is estimated to amount to about 1 per cent. of the weight of carcase for sheep and goats and about 1.5 per cent. for pork. Unlike beef, cuts from these carcases are not boned which accounts for the relatively small amount of waste. Meats held in refrigerators dries out somewhat and this shrinkage in weight must be added to that referred to above.

There is, however, little doubt that Indian meat supplies are in many cases not so good as they might be owing to insufficient "conditioning" before consumption. The technical aspects of the subject have been for some time under investigation by the Meat Research Institutes in some foreign countries and their conclusions show that "conditioning" effects a marked improvement in palatability, particularly in respect of tenderness and also in juiceness and texture. Further the coarser joints benefit more by "conditioning" than the prime joints.

Municipal authorities in India in planning schemes for the erection or enlargement of slaughter-houses or abattoirs might, therefore, well consider the desirability of providing better hanging facilities for the use of the meat trade after the Western fashion. Improvements in slaughter-houses in some of the urban areas and providing covered sheds in places where slaughtering is done in the open, will help in reduction of losses. It is also necessary to provide fly proof doors and windows in slaughter houses. Besides this, as far as possible, the worker must be provided with mechanical facilities for carrying out processes without touching the product with his hands.

It cannot be too strongly emphasised that whenever a butcher is getting undue spoilage of his meat, the chief cause is that the meat is not being handled under proper conditions of cleanliness during dressing the carcase, cutting it up and hanging it. In such a case, the following are the points that need attention :

(*a*) In the slaughter-house :

1. Boil all knives, clothes and utensils before use, or at least thoroughly cleanse them.
2. Avoid dragging carcases against walls or floors. Hose away blood and faeces as quickly as possible.
3. If possible, transfer the carcase to a separate room, to cool and set.
4. After the day's killing, wash all walls and floors or at least hose them thoroughly. See that all drains were properly, and never allow decaying refuse and manure to accumulate.

(*b*) In the shop or stall :

1. Handle the meat as little as possible.
2. Destroy all trimmings and pieces of meat which show obvious growths of moulds and bacteria. Wash the hands after touching such meat and wash immediately in boiling water knives and clothes used to trim it or wipe it down.
3 Avoid exposing in the warm shops or stalls for any length of time meat which is later to be kept in the ice box or cold storage.

(c) *Extent of traffic.*—Practically the entire quantity of meat produced in a place is conveyed by road and consumed locally and consequently there is no meat traffic either by rail, river or sea excepting the small quantities that are carried either in railway restaurant cars or ocean going ships for their use. Some small quantity of pork, bacon and ham as also beef is exported from Aligarh and Bihar to their adjoining states but the quantities are reported to be quite negligible.

(2) TRANSPORT

Transport is one of the problems which has always been of great concern to butchers and other interested in Meat trade. In the pioneering days, carcases had to be transported in bullock and horse driven carts. But today almost all the means of transport used for carrying other agricultural products are employed also for transporting meat. The mode of transport largely depends upon the distance to be travelled, the trips and number of carcases to be conveyed, the facilities available for quick and safe despatch and the cost involved.

Generally speaking, in urban areas, meat is carried from slaughter-houses to butcher shops in meat-vans, both bullock and motor driven, horse tongas, thelas or ekkas, and cycles. In rural areas, where proper transport facilities do not exist, the carcases are

(1)

(2)

(3)

(1) A hand driven cart loaded with sheep carcases—Madras.
(2) Meat van used for carriage of carcases from slaughter-house to the market—Bangalore.
(3) A horse-carriage with carcases for delivery to market—Madras.

carried either as head loads or in bullock driven carts. At a few places, shoulder slings called '*Benghis*' (bahangis) are also known to be used for transport of meat.

(*a*) *Head-loads.*—In rural areas, comparatively small quantity of meat is handled daily and as such no conveyance is ordinarily used for its transportation. The butchers generally slaughter one or two animals in their own premises and whenever any need arises for its conveyance from one place to another the same is taken as head-loads by the butchers themselves. In cases where hired labour is engaged, the cost of transport varies from 4 to 6 annas per maund.

(*b*) *Country-carts.*—Small lots of carcases in all parts of the country are transported by country-carts drawn by bullocks mostly both over short as well as long distances. In many cases carts drawn by single animal are used. Hand-carts pulled by men are also used at certain centres for transporting small loads of carcases from one shop to another.

There is no uniformity in regard to the cost of transport by country carts and they vary widely from place to place. There is also no fixed unit of charge, although the general practice is to charge by the weight of carcases carried which is settled by mutual negotiations. The charges vary from 0-4-0 to 0-6-0 per maund per mile.

In the urban areas the rates charged for conveying carcases by country-carts vary considerably from centre to centre and depend upon local custom and the distance to be covered. They are usually much higher than the rates prevailing in rural areas. The cost varies in different parts between 0-8-0 and 0-12-0 per maund per mile, according to local conditions.

(*c*) *Horse-tongas, theilas, ekkas, etc.*—They are used for transporting carcases from urban slaughter-houses to the meat markets or stalls of local butchers. As in the case of head loads, it is difficult to estimate accurately the cost of transport by tongas, theilas, etc. Often they belong to butchers and they use them for multiple purposes. In areas, where tongas, etc., are hired for carrying carcases from slaughter-house to market, the rate depends upon the competition amongst the owners of tongas, etc. and also upon the availability of alternative mode of transport, the charges vary from place to place but roughly they vary from -/10/- to -/14/- per maund per mile according to local conditions. This would appear to be slightly higher, as compared with charges for other commodities. The reasons are that carcases cannot be loaded to the full carrying capacity for obvious reasons, and that most of the tongas and their owners are rather reluctant to carry carcases, partly on religious grounds and partly due to the reasons that the carts get badly soiled with blood, etc.

(*d*) *Meat-vans.*—Under municipal bye-laws, meat cannot be exposed and conveyed in open carts, though in many places this is honoured more in breach than in observance. On this account major municipalities like Bombay, Madras, Bangalore, Ahmedabad, etc., provide motor meat vans while some others have meat vans driven by bullocks, for conveyance of meat carcases from slaughter-houses to markets. All these meat vans are zinc-lined throughout so as to stand thorough washing and properly fitted with hooks so as to enable carcases being hung from the roof. This is desirable because it ensures free circulation and avoids bruising. But it is not uncommon to see the carcase piled up on the floor or dumped on one over the other in some of the meat vans.

As a rule, the charges between a slaughter-house and market are more or less fixed irrespective of the distance to be covered, but in some places the transport charges are included in the slaughtering fees. The charges vary from place to place ranging from -/4/- annas to -/12/- per beef and buffalo flesh carcase and -/-/9 to -/1/6 per sheep or goat. Motor vans are becoming popular because of their speed and their hygienic built body.

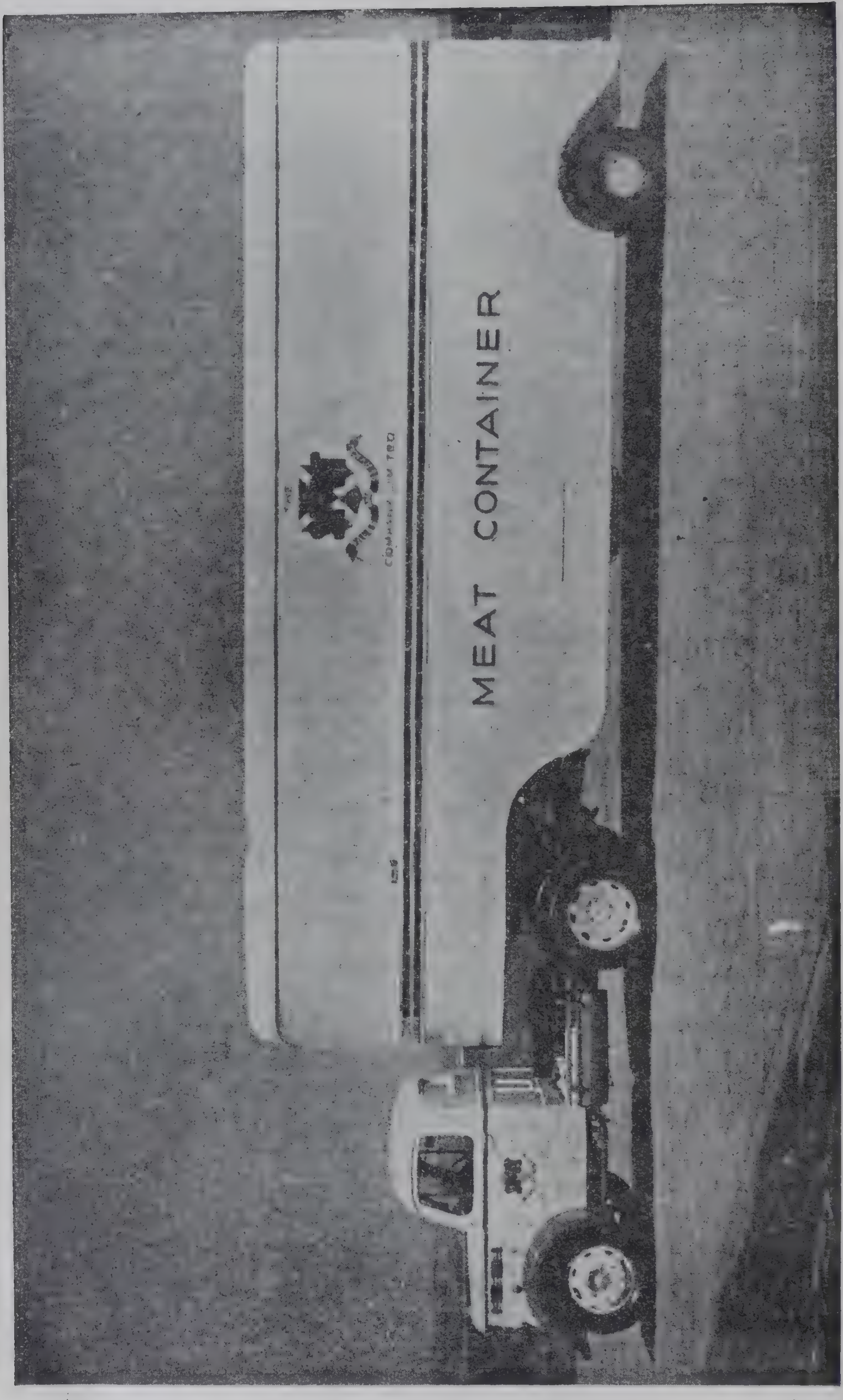
It will thus be seen that transport charges are not standardised, but are based on a number of factors. Distance is the main consideration, but degree of accessibility, condition of the roads, and the size of the load, etc. have all bearing on the cost of transport. It may also be mentioned that many vehicles at present in use for the delivery of meat are unsatisfactory and much of the criticism relate to the inadequate covering of the meat.

Vehicles used for the transport of meat must be capable of being cleaned easily and thoroughly. It follows that the interior surfaces, including the floor should be hard, smooth and impervious and to reduce any risk of men slipping when loading and unloading meat, the floor must have a non-skid surface. The vehicle should be totally closed when meat is being transported but when meat is being loaded or unloaded these should be access from outside the vehicle to as much of the floor area as possible to minimise walking on it with feet soiled from the street. It is also essential that the meat should be completely covered while in transit and that it should not be in contact with a tarpaulin or any other covering. It is, therefore, suggested that under the slaughter-house rules, it should be made obligatory that every person who conveys or causes to be conveyed any meat in a vehicle shall :

(*a*) cause to be kept clean the inside and the covering of the vehicle, the receptacles in which the meat is placed and such parts of any slings or other apparatus used for loading or unloading as come into contact with the meat or its covering ; and

(*b*) if the vehicle is open at the top, back or sides, shall cause the meat to be adequately protected by means of clean cloth or other suitable material.

The probelm of refrigerated transport has not so far received any attention in this country. The necessity for refrigeration is nowhere stronger in a tropical climate and particularly for an article of such short life as meat. The present trade in meat in most of the places probably does not justify provision of cold transport facilities, but if such transport were available in large meat consuming towns like Bombay, Calcutta and Madras, etc., the keeping quality of meat may


MEAT CONTAINER

Modern Meat Container (Photo by courtesy of Vauxhall Motors Ltd.—London).

be enhanced and loss minimised to some extent. In the United Kingdom improved modern meat container as illustrated on the opposite page has been designed by Vauxhall Motors Ltd., for this purpose. It is completely insulated and lined with light sheeting material. The access to the body of the container is by means of full width double doors at rear and carcases are suspended on monorail fixed to specially reinforced roof. Front offal compartment is lined with zinc. It is claimed that where carcases need to be taken long distances, meat containers of this type enable the butchers to transport their stock with much greater speed and less wastage than ever before. Likewise a large firm of wholesalers has planned to transport meat in mobile refrigerators, the first of a fleet of mobile cold stores has been launched recently. (Dec. 1951) and in the near future, the company will have a fleet of ten or more 10-ton articulated mobile cold stores in co-operation. The vehicles of this type can carry a much larger load than the insulated wagon normally used by wholesalers, so that time and wages are minimised. Also, large quantities of food are wasted annually owing to unsatisfactory conditions of distribution. In the mobile cold stores all the foodstuffs distributed can be sold at a temperature of 14°F., so that no deterioration occurs. By enabling fresh frozen foods to reach the consumer in perfect condition, mobile cold stores should represent a valuable contribution towards the solution of this very serious problem. The development of refrigeration and refrigerator vehicles in the United States of America and United Kingdom have thus made it possible to process, grade and package dressed meat in the producing areas and send it long distances to market for distribution. In India, the trade in meat has to wait until such time when the refrigeration facilities are available.

(3) MAL-PRACTICES IN MEAT TRADE

The consumer thinks of meat as that edible portion of a cut or joint which can be carved with ease and masticated with gastronomic satisfaction. Bone and fat are frowned upon as being something the retailer is constantly trying to palm off on them for the purpose of making extra profit. The butcher thinks of meat in its broader sense as including all the structures of the carcase such as lean, bone, fat, tissues, ligaments, blood vessels etc. Obviously this difference in definition causes occasional misunderstanding between the butcher and the consumer. There is little doubt that the basis of the practice is an attempt to conceal the lack of mascular development of the carcase, it is, therefore, fraudulent and should not be permitted. This is forbidden in advanced foreign countries. In some places thin fat spreads are used in lean carcases in order to upgrade the meats thus enabling a higher price to be obtained. Beef and buffalo flesh are often sold mixed and likewise mutton is substituted for goat flesh and *vice versa*. At present where there is no meat inspection, dog's meat may even be offered for sale as goat's or sheep's meat. Diseased meat or still born meat unfit for human consumption may also be marketed.

In many places, particularly big towns, like Calcutta, Bombay and Madras, stale, unwholesome or overnight left flesh is sometimes palmed off as fresh meat. Most of the consumers, as a rule, are not able to differentiate between fresh and stale meat and the butchers who know this, always endeavour to gamble on the ignorance of the buyers.

In some of the meat markets, it is also observed that in order to secure business, the butchers give tips to the customer's servants and make the margin for it by supplying inferior and poor quality meat. This practice is at times noticed even at public institutions, *e.g.*, hospitals, messes, hostels, etc., where the charge of receiving the meat is invariably in the hands of sub-ordinates and low paid staff.

The butcher should employ fair practices and sell only the good quality meat prepared in the manner demanded by the customer. He should recognise that a customer is the most important person to enter his business—he is a human being with a feeling and emotions like his own with biases and prejudices. The butcher is not doing a favour by serving him—rather the customer is doing the butcher a favour by giving him the opportunity to do so. And finally that a customer is a person with wants that should be filled with profit to both.

F.—Price spread from producers to consumers

The margin between the price of various meats received by butchers and the price paid by the consumers varies from place to place. The cost of assembling and distribution very much affects the margin inasmuch as the market and slaughtering fees, flaying, dressing and transport charges, stall rents and spoilage in store, etc., etc., have all bearing on the price spread from the producers to the consumers. The producer's share in the consumer's price is relatively high when meat is sold by him direct to consumer, *e.g.*, hawking. A butcher's share in the prices paid diminishes every time the food animal or dressed carcase changes hands (from wholesaler to retailer), since each seller must have his own margin of profit before he sells out his goods to another. Another factor which sometimes determines the margin of profit is the ruling prices for hides and skins. The correct position with regard to the price spread from producers to consumers in a few centres and for different kinds of meat can best be seen from Appendix XXI. It will be observed that the butcher's share in the profit ranges from 6 per cent. to 20 per cent. of the selling price.

G.—Storage

(1) METHODS AND COST OF STORAGE

Most of the meat is ordinarily sold as fresh and as such butchers do not have to store meat for long periods. Care is also taken by the butchers to see that animals are slaughtered according to the requirements of a place. In spite of this, some storage becomes inevitable. In warm weather meat goes bad more rapidly than in cold. This is because bacteria and moulds grow much more rapidly at high temperatures than at low ones. A low temperature is artificially produced in the ice-box, and in warm weather meat keeps many times longer in this cold air than in the outside air. Meat is, therefore, sometimes stored in ice. This is mainly done to either meet any sudden rise in demand on festivals like Christmas, Easter, Idd, etc. or sometimes when meat is left over as unsold. The storage in such cases is done by keeping meat in big or small wooden boxes fully packed with crushed ice, but the quantity of meat so stored for long periods is negligible at present. The period of storage differs in different areas and depends upon factors such as type of the flesh, nature and efficiency of its cure or preservation, the season and the trade demand. Generally speaking, the period of storage in cases of fresh meat does not exceed 12 to 24 hours. The cost of storage in ice roughly comes to Rs. 2-0-0 to Rs. 2-8-0 per maund of meat. Ice is usually available in all urban places, but it is a scarce commodity in many rural areas due to the fact that in such areas ice plants do not exist, and heavy transport charges from the nearest ice factory make the ice beyond the means of the butchers.

In rural areas the unsold meat is hung up from iron hooks either in the stall or in a well protected and cool place. In some cases the unsold meat is kept in baskets, covered with a piece of wet cloth Sometimes a little salt is sprinkled over the unsold meat and stored in boxes to be sold the next morning after mixing it with the fresh meat.

It is only in a few important markets like Bombay, Madras and Calcutta that meat carcases and processed meat products like ham, bacon and sausages are kept in cold storage for any length of time. Here, also endeavour is always made to dispose of the fresh meat stocks as quickly as possible. The period of storage in case of raw or fresh meat varies between 12 to 36 hours, and in rare cases, may extend little more. The ideal temperature to aim at in a refrigerator is slightly above the freezing point of the meat, about 38°F. The cost of storage naturally varies with the place and type of storage. In the Crawford Market, Bombay, there is a cold storage provided by the Municipal Corporation for storing of meat, fish, fruits, dairy products, etc. The quantity of meat kept there varies from 3,000 to 6,000 lb. and edible offals like brain, plucks, trotters, etc., from 500 to 1,500 lb. The schedule of charges is 4 annas and 6 annas per diem for 25 lb. meat and offals respectively. The peak period for storage is May to July because of the high temperatures prevailing in these months. Likewise in Madras the schedule of charges per day of 24 hours or part thereof is annas 2 for 10 lb. and below meat ; annas 5-9 over 20 lb. upto 30 lb. and Re. 1 for over 90 lbs. upto 100 lbs. of meat. The ice factory at Nagpur provides storage and preservation facilities for mutton and goat flesh only and it charges -/8/- per carcase for a period of 12 hours.

(2) COMMON DEFECTS AND LOSS CAUSED TO STORAGE

As already stated raw meat is not ordinarily stored in any appreciable quantity in this country. What is more that it is not stored for any length of time. Still wherever small quantities that are stored, combined with primitive methods adopted for the storage of meat in the country side, entail some loss in the aggregate which could easily be avoided if there was a chain of cold stores attached at least to some important markets, like Calcutta, Madras, Delhi, Lucknow, etc., etc. It has been estimated that due to lack of storage facilities meat worth 40 to 50 thousand rupees per annum is wasted in Bihar. In the Madhya Pradesh and Uttar Pradesh, meat worth Rs. 10,000 and Rs. 60,000 is wasted annually. The total loss caused in storage in India is computed roughly at 0.2 per cent. of the total production, *i.e.*, about 25,000 maunds valued at Rs. 15 lakhs.

Meat deteriorates very quickly in hot weather. It is also liable to insect and bacterial attack. If not stored properly it becomes stale and a bluish tinge comes over the meat quickly and it emits an offensive rotting smell. Lean meat with little fat shrinks more rapidly and begins to deteriorate in flavour in storage more quickly than does meat with considerable fat. In this country, in spite of the huge volume of the meat trade, majority of the wholesale and retail butchers seem to be yet ignorant of the benefits accruing from the use of cold storage. Cold storage in foreign countries has given great stimulus to the meat trade. In the United States of America and other advanced countries, special chilling rooms are provided in the slaughter-houses for this purpose. Amongst others, the following have been listed as contributions of refrigeration in meat storing and packing :—(1) It prevented premature decay of perishable products ; (2) lengthened the period of consumption and thus greatly increased production ; (3) enabled the owner to market his produce at will ; (4) made possible transportation in good condition from the point of production to point of consumption, irrespective of distance.

H.—Research work on meat

As far as it is known, no research of any kind on meat is carried on anywhere in this country. Some of the state Departments of Agriculture have occasionally conducted breeding and feeding tests on cattle, sheep and goats and pigs. Upto the present, however, the criteria by which food animals have been judged as potential meat producers and by which the quality of their meat has been judged in terms of the consumers requirements have all been empirical. The research necessary to obtain the basal knowledge required to find out what constitutes good meat, how it can be produced, and how it can best be preserved and prepared for consumption, therefore, forms the research programme of a Meat Research Laboratory in India. Some of the other items of research in relation to problem of meat are :

(*i*) biological research dealing with fresh meat, effects of temperatures on shrinkage, maintenance of quality, changes brought about by ageing and storaging of meat ;

(*ii*) technological research into methods of processing and preserving meat and modern methods of handling meat and meat products ;

(*iii*) research into the design and equipment of slaughter-houses, cold storages, transport, etc., and

(*iv*) utilization of meat by-products and development of medicinal and other new products of animal origin.

In the United States of America, United Kingdom and other advanced countries, much research is devoted to the improvement of recipes in order to produce articles of greater uniformity and consumer acceptance. Included are investigations on canning and sausage manufacture, smoking and curing. With fresh meats, attention has been given to the influence of such factors as temperatures, shrink and coverings on the maintenance of quality. All the laboratories there concentrate on more modern methods of handling all meat products. One firm has a large research organisation for the development of medicinal and other new products of animal origin. The manufacture of pharmaceuticals (from some twenty glands or tissues several hundred pharmaceuticals are made) is practicable only for big packing houses owing to the large quantity of raw materials required. Research is directed towards improving purity and yield of the active factors. Other articles from animal by-products are gelatine, chemicals from fats, adhesives and bacteriological media.

The laboratories most closely connected with the meat packing industry are those of the American Meat Institute Foundation at Chicago. This was founded in 1944 at the University of Chicago. In June 1949, new laboratories in a well designed specially constructed building were opened; the cost with equipment was given as some three-quarters of a million dollars.

According to a published statement, the American Meat Institute Foundation "was established as not-for-profit organisation to undertake a comprehensive scientific research and educational programme, embracing all scientific and technological aspects of production, processing and use of livestock and products derived from livestock. The scope of its scientific interests includes the processing of sausage, cured and other meat products, by-products, utilization, nutrition and public health". Some promising work of a more fundamental character is being conducted in institutions of a quasi-academic nature, supported by funds contributed by the industry. More recently, important research work on the use of Ultra-Violet rays to preserve meat and meat-products at temperature above freezing point has been carried out by a scientist (M. M. Danilov), of the Leningrad Institute of Soviet Trade and workers of the Kirov Meat Combine in Leningrad. Dozens of lamps producing Ultra-Violet rays have been installed in the storage chambers of the Combine. Sausage products treated with the rays keep for 20 days instead of 5 without their taste being impaired. Fresh meat, treated with rays for between 5 and 7 minutes, can be kept for 5 days instead of one.

The Government of India should sponsor and establish a Central Technological Research Institute at some suitable centre to conduct and carry out a comprehensive scientific research embracing all aspects of production, processing, utilization of the meat industry

I.—Butcher's Associations and Co-operative Societies

The prosperity and development of the meat industry of any country is naturally dependent on the socio-economic position of its butchers.

The meat industry in this country is neither organised nor is it localised in any area or areas. The butchers generally belong to a very low strata of society. Although in recent years butchers have become more enlightened and educated, as a class, they are still rather conservative and slow to adopt progressive methods in their trade.

The butchers are generally illiterate, highly individualistic in outlook and are in no way concerned with the proper marketing of their produce. No attempts have been made in any part of India either to organise them to safeguard their own interests or for giving them academic, vocational or industrial training, with the result that there are no butchers' associations or co-operative societies in this country.

In some of the important concentrated centres like Bombay, Calcutta, Madras, etc., where the number of butchers is comparatively large there are some sort of butcher *Jamiats* (associations) to look after their interests. Though these *Jamiats* are all unregistered bodies, yet they have their elected *Chowdhuries* (headmen) and other office bearers to look after the affairs of these *Jamiats*. In Bombay they have two "*Kasai Jamiat*" (Butchers' associations), one each at Bandra and Kurla. At both these places a charge of three pice per sheep, and goat is made from all butchers as *Jamiat* fee and the amount so realised is utilised for the maintenance of mosques and burial ground and other welfare purposes. These *Jamiats*, beyond this, have not done anything else to effect improvement either in the standard of flaying and dressing of the carcases or in any other directions.

In many advanced countries, there are various trade associations to look after the interests of their constituents. For instance in the United States, dealing for years in a very popular though highly perishable food product the producers and processors were able to meet consumers demand without much fan fare or high pressure advertising. New food products and some meat substitutes however began to find their way into homes and suddenly the meat industry discovered that it was losing ground. This condition made it necessary for the agencies affected to get together and work out a programme to combat this. and not only to champion the cause of meat but to discover some of the nutritional possibilities of their product. As a result the National Livestock and Meat Board was organised in 1922. The Board was unique in that every branch of the industry was given representation. The organisation, at this writing consists of eight departments. Each department has its separate function but all operate as a team to carry the story of meat to the retailer and the consuming public. Further each department is equipped and geared to spread the gospal of meat in all its newer phases to the public through an extensive educational programme. This is accomplished through (1) lecture-demonstrations to retail meat dealers in which modern cutting methods, pricing retail cuts, attractive display and clever advertising are explained and emphasised ; (2) Lecture courses for housewives as well as for students in high schools and colleges, where they are taught how to buy and cook meat, its food value as the newer knowledge about meat ; (3) meat exhibits at food fairs, livestock shows and leading State and country fairs (4) meat poster and meat story contests and (5) the distribution of thousands of copies of meat receipt books, meat charts in colour and other meat literature. The National Livestock and Meat Board receives its revenue from voluntary contributions made by livestock growers and meat packers, collected at the time the livestock is sold.

The National Association of Retail Meat Dealers, as the name implies, is an association of the retail meat dealers of the United States combined under the slogan "one for all and all for one". It has local organisations in 79 of the principal cities from coast to coast and represents a large bulk of the total volume of business done by the approximate seventy thousand retail meat dealers in the United States. The American Meat Institute, whose headquarters are in Chicago, is yet another trade, research and educational association of the meat packing industry in the United States. The Institute is a highly organised and extremely efficient body exercising a profound influence upon the industry which it represents. As its title would imply, it deals only with the meat industry and it is, therefore, equipped to give a very much wider form of assistance or advice. A point worthy of note is that by maintaining experts on its own staff it is able to give a much more specialised form of service than would otherwise be possible. An outstanding example of such service is in the judicious use of advertising which has increased the consumption of meat over many other foodstuffs.

The Institute amongst others maintains the following services:—

(1) It keeps members fully informed on the livestock and meat situation, Government activities and regulations general business conditions and other important matters.

(2) It conducts correspondence courses in co-operation with the University of Chicago. These courses include such subjects as the marketing of livestock and meat, sausage and ready-to-serve meats, meat packing, plant management and by-products of the meat packing industry.

(3) It undertakes advertising on behalf of the meat industry particularly in magazines and news-papers and through thousands of local retailers, and

(4) It provides a research institution service for members, covering control of the product, lard processing, dissemination of information on research and scientific developments having application to the industry.

Co-operative Societies.—In all the progressive countries of the world, great importance is attached to co-operative marketing as one of the surest means of not only bettering the lot of the butchers but assuring the quality of the meat placed on the market. Co-operative Marketing Societies help to obtain better returns, encourage the members to produce quality and graded meat and facilitate installing of cold storages etc., etc. There are however, no co-operative societies for sale and purchase of meat in India. The Co-operative Department has not done anything to organise production, assembling and distribution of meat in any State. During the last war, however, a few well-to-do individuals came forward to interest themselves in the trade and dehydrated meat in fairly large scale was supplied to the Defence Services. They made in their own way a little contribution to the general improvement in the meat supply and development of the meat industry. They maintained a fairly high standard of quality and were instrumental in acquiring the much needed practical experience in the large scale production and distribution of meat under Indian conditions.

At present the butcher has little or no power to hold on to his product and is anxious to dispose it of as quickly as possible without caring for its quality. It is often contended that there are too many local dealers and that the margin of profit taken by them is too large. It is believed that the production of meat is on small scale and that the meat sold in a given community could be more economically assembled by one agency than by several and that if this was done by a cooperative agency the profit that would otherwise go to the independent dealers would accrue to the producers in the form of higher net returns. The first step for developing the meat industry, therefore, is the grouping of small producers into a co-operative organisation. These Butchers Co-operative Sale Societies could be established in selected concentrated areas, mostly in important cities, exclusively devoted to production and marketing of meat, with the following main objects in view :—

(1) To purchase members' meat for sale to consumers.

(2) To ensure that the meat put on the market is of high quality.

(3) To advance loans on easy terms to members for the purchase of food animals.

(4) To distribute loans or dividend to the members from net profits after setting apart, say, 25 per cent. for Reserve Fund and other purposes.

The meat handled by these co-operative societies could with advantage be sold direct to big consumers like (*a*) hospitals, hotels, messes and club, (*b*) to Stevedors, Dubashes, army authorities, etc. (*c*) through stalls in markets in different localities in a city and (*d*) to the public through home delivery system. In the beginning there may be some opposition from butchers against such a move, but it is hoped that once the butchers of one or two important cities like Bombay, Madras or Delhi can be persuaded to take up this work, those at other centres will soon appreciate the benefits and follow suit. The societies should be organised and supervised by the local Co-operative Departments, but on technical matters, they should be advised and guided by the Directorate of Marketing and Inspection.

In highly industrialised countries like U.S.A., U.K., Holland, etc., meat co-operatives have been very successful and made substantial headway and there is no reason why given the urge and the necessary facilities, meat co-operatives cannot rise to the occasion and increase the available supply of good quality meat very considerably in this country. The Government should, therefore, not only sponsor or encourage the organisation of co-operative meat societies but also assist them financially and with trained personnel at least in the initial stages. The difficulties are no doubt formidable, though not insuperable.

J.—Note on the disposal of blood, ingesta, bones, horns, tail-stumps, guts, etc.

Since earliest times, man has used hides and wool to make clothing and other articles of wear. With the growth of meat-packing plants in advanced countries, the war on waste began in earnest. Science found new ways to use by-products. Bristles make brushes. Bones make knife handles. Hair makes unholstery paddings. Bones, blood and scraps go into animal and poultry feeds. In the past half century the research has found great variety of other uses for meat by-products. Fats and lanolin are the base of many cosmetics, healing creams and beauty aids. Photographic film is coated with gelatine compound. Gelatine and glues are put to many other uses. Soap, glycerine, blood meal, tankage, curled hair and fertilizing materials etc. are all prepared from by-products of pigs and other animals. The lard has other use than to cook with. It is used for illumination, as lubricant, and for manufacturing chewing gums, soap, candles, etc.

Life has been lengthened for people suffering from diabetes, anemia and other diseases by the use of drugs such as insulin, liver extract, pepsin, adrenalin, etc. made from animal glands, etc. But for the painstaking care of meat packers these glands would go to waste. In short, great strides have been made in conserving and utilising the by-products and each new use for by-products adds value to livestock and directly benefits producers.

In practically all slaughter-houses and meat packing establishments in U.S.A., the utilization of edible and non-edible offals and other by-products of animals slaughtered, has become an industry in itself with the result that today there is very little of the live animal which is not utilized to the greatest extent. This greater utilization of the by-products has made it possible to pay the producer an increased price for the livestock purchases and to sell the finished products to the consumer at a cheaper price. Before the use of by-products, the packer in the U.S.A. was compelled to dispose them of at a throw-away price.

Unfortunately in this country, the bye-products still continue to be unexploited in the meat trade. In rural areas all the blood, ingesta, horns, bones, etc. usually go to waste. In urban slaughter-houses, barring few exception, proper arrangements for collection of these do not exist. The ways these products are disposed are detailed below :—

Blood.—The blood accounts for about 8 per cent. of the body weight of an animal but no method of slaughtering rids the body of all this. Some of the blood is bound to remain in the small arteries even when the most thorough method of slaughtering is practised. It is estimated that the average amount of blood obtained in slaughter cattle in India, is 20/25 lb. Cows yield more blood than bulls or bullocks of the same weight. The amount of blood released from a slaughtered sheep or goat is roughly 3 lb. The slaughter of pigs yields 4 to 6 lb. of blood. The weight of liquid blood, however, depends on the build and breed of the animal.

At a few places like Bombay, Calcutta, Madras, Hyderabad (Deccan) etc. the right of collection of blood is leased out annually by auction to the highest bidder. In some places, a small garden is attached to the slaughter-house and all the blood and waste water is allowed to run into it for irrigation purposes. In Bandra slaughter-house, Bombay blood is collected in big open pans, cooked for 2 to 3 hours, until it coagulates, then spread on a pucca floor and dried in the open sun. This is packed in bags and sent out as manure for tea and sugar plantations. In pig slaughter-houses blood is sometimes collected and utilised in preparation of sausages. Blood as a fertilizer is valuable for its nitrogen content and as such forms a very good manure for crops particularly grape orchards and coffee plantations. As a meal the high protein content of about 80 per cent. makes it an excellent ingredient in mixed feed and on this account blood meal is largely used as poultry feed for the rearing of poultry and the young stock. It is, therefore, recommended that the State Governments should direct District Magistrates to impress upon the Municipal Boards and Notified Area and Town Area Committees in their districts to implement early a scheme for converting blood into blood-meal in various slaughter-houses.

Ingesta.—Ingesta is the unassimilated food left out in the stomach and intestines after the animals is slaughtered. In most of the places this is all wasted. It is only in a very few of the slaughter-houses that the contents of the ingesta is emptied out in specially built open pits and allowed to rot there for some time. After a period of fermentation the stuff is taken out and sold as manure.

Bones.—Bones form about 20 per cent. of the total body weight of an animal. These products, which were formerly merely troublesome refuse, are now used for an extraordinary variety of purposes. The hard bones, particularly from the shin and shank and the horns are manufactured into buttons, combs, toys, knife handles, artificial teeth and numerous other articles, or are ground into powder for case-hardening steel, or burned into charcoal for use as a refining agent or as a pigment for paints etc. Alternatively, bones may be used after processing, as a fertiliser or as a feeding stuff, particularly for poultry. The bone-meal is used as manure and animal food while the bone-grit is utilised in the manufacture of glue, gelatine, ossein and also for refining sugar. Bone meal is very rich in phosphates and as such very useful as a manure particularly in coffee and paddy plantations. The estimated production of bones in India is between 5-7 lakh tons ; out of this only 1½ lakh tons are collected. If the collection is properly organised and a local market created for its consumption, it should be possible to collect 3 to 4 lakh tons of bones quite easily. The consumption of bone meal for manure purposes is not large in India due to religious prejudices in certain sections against its use. Therefore some is exported out. The price of raw bones is about Rs. 8 per maund or approximately Rs. 200 to Rs. 250 per ton.

So far glue is concerned, there are about 12 factories in India principally in Bombay and Calcutta where glue is manufactured from hide-trimmings. The aggregate production during 1948 roughly amounted to 650 tons.

The three main types of glue are, hide glue, bone glue and blood albumin glue. The oldest and widest use for glue is in the furniture and veneer industry. Glue has so many varied uses that it has been said that glue holds the world together. It is used in sizing paper ; in the manufacture of wool, silk and other fabrics ; in sizing the walls that are to be painted ; in the manufacture of sand and emery paper to hold the abrasive on the paper ; in the manufacture of dolls, toys, ornaments, in the making of picture frames, mirror frames, billiard balls, printing rolls, gummed tapes, automobile bodies, caskets, leather goods, book binding and many other uses.

Gelatine is another useful product produced from white bones, *i.e.*, calf, goat and sheep skins, etc. The Indian sun-dried bones are very suitable for the production of gelatine, since their grease content is low and they produce ossein of very good quality. The second main material used in the production of edible gelatine is untanned scrap from tanneries such as limed trimmings and pieces which are unsuitable for the leather industry. There are thus, two classes of gelatine, depending upon the material from which they are made ; hide gelatine and bone gelatine. One of the most important requirements of the gelatine manufacture is a plentiful supply of water. Gelatine is obtained by treating hide pieces or ossein with water at a high temperature. Gelatine is nothing but pure form of glue largely used for culinary purposes. It is used in the manufacture of jujube, confectionary, ice-cream, jelly making, as also in the making of certain pharmaceutical preparations, capsules for medicines, coating pills and various other uses. Chemically there is no difference between glue and gelatine but the latter is made with more care and from better stock under strict sanitary conditions so as to yield a material of high purity. Extract figures regarding the existing total Indian capacity for the manufacture of edible gelatine are not available but it is not more than 30 tons per annum. The imports of gelatine into India for the last 13 years are shown in the table below :—

TABLE NO. XXVI

Imports of Gelatine into India

Year	Quantity	Value
	(Cwts.)	(Rs.)
1938-39	1,686	51,261
1939-40	1,397	1,18,440
1940-41	1,194	1,43,119
1941-42	2,199	2,24,496
1942-43	274	45,338
1943-44	313	1,39,059
1944-45	350	48,145
1945-46	721	1,37,854
1946-47	1,380	3,57,390
1947-48	825	1,98,825
1948-49	1,883	4,39,358
1949-50	1,975	3,48,031
1950-51	1,028	2,37,357

The demand in India for edible gelatine is far greater than the existing production. The best edible gelatine used to come from Belgium. The average retail selling price of gelatine manufactured in India is Rs. 4/- per lb. It will thus be seen that there is ample scope for the development of this industry in India.

Horns.—Horns, unlike bones, are as a rule not put to any commercial use on any large scale. In some places, however, they are used in the manufacture of toys, combs, buttons etc. The horns are also crushed at one or two places to form horn meal, and exported to foreign countries. Hoofs are mixed with horns and crushed and the mixture known as horn and hoof meal is utilized in the manufacture of foam compound for use in fire extinguishers.

Tail stumps.—They are generally thrown away and in only few cases the hair attached to the tail stump are collected and sold to the brush manufacturers. A portion of the tail at the base with some of the flesh still sticking to it is sometimes also mixed with meat. In foreign countries, tails, snouts and ears are converted into gelatine and glue.

Guts.—The intestines when thoroughly washed and freed from fat etc., are called guts. The guts obtained from cow, ox, sheep, goats and pigs only are used for commercial purposes, such as manufacture of sausage casings, categut for use as surgical ligatures, and strings for tennis rackets, musical instrument, etc. Buffalo and dead animal guts are not put to any use. They are either thrown away or sold as "*Ratab*" for dogs. On an average cow and ox yield roughly 36 feet length large intestines and 140 feet small intestines. Similarly sheep and goats yield 20 feet and 80 feet large and small intestines.

As with bones, the handling of gut is entirely carried on by specialist firms who depend for their supplies mainly on the recognised slaughterhouses in towns and cities. The gut is usually bought on contract which runs from 6 to 12 months. The price paid for the gut varies considerably according to the facilities that exist for such collection. Where facilities for cleaning the gut are primitive, butchers may obtain a low price per set, while where the gut can be promptly and properly handled, as in the large slaughterhouse, it commands better prices.

In this country, gut is always hand-cleaned. It is claimed that hand-cleaning is the best and safest method as the gut is liable to be torn. The best gut should be of pinkish shade which indicates that it has been promptly and efficiently handled. Inferior grades are greyish, which may be due to delay in cleaning. Gut left 24 hours without being washed may turn black and is then valueless.

The cow and ox guts after cleaning and washing are dried, rolled and made up in hanks of 200 yards each and packed in wooden cases for export to foreign countries, mostly to Portugal, Spain, Switzerland and all parts of Europe with the exception of United Kingdom.

The sheep and goat guts being extremely thin and fragile are to some extent utilised within the country itself for sport goods, though they are also exported to foreign countries in considerable quantity. Sialkot was the chief centre but after the partition of the country in August 1947, the Non-muslims sports goods manufacturers had to leave behind their factories in Pakistan and migrate to India. Some of them settled in Jullundur and the others migrated to Meerut and Agra in Uttar Pradesh where the Government have rendered all possible help to these industrialists in rehabilitating them by giving them land, light and loan. The condition of sports goods manufacturers, immediately after the partition of the country, was uncertain but now they have settled themselves on sound footing to stand the competition from their counterpart in Sialkot. Sports goods industry is a cottage industry and there are about 250 manufacturers in the country producing about 50 lakh rupees worth of sports goods annually.

It is rather difficult to state the exact quantity of guts collected in the country but the importance of the trade could be judged from the fact that approximately 2,22,48,000 feet of the cattle intestines and 1,38,95,98,145 feet of sheep and goat intestines are reported to be collected annually in Uttar Pradesh alone for commercial purposes. It may, however, be stated that the whole of the production is not collected anywhere and that a fairly large quantity of gut goes waste in many places, especially in rural areas and small towns. In most of these slaughter-houses, no facilities exist for cleaning and the supplies being too small, it becomes uneconomical to collect the guts.

It might be stated that with the prohibition of cattle slaughter in good many States the business has been adversely affected in last 2/3 years. It is fast disappearing and it is quite likely the trade may altogether disappear in the near future. The saving of casings or guts is one more step toward the saving of the many by-products of the modern slaughter-house. They provide additional revenue from what one might ordinarily consider waste. Prior to partition sheep sausage casings or guts were being exported to various foreign countries through the port of Karachi. After partition, however, the export of these articles from India to United Kingdom and United States of America has come to a standstill in view of the fact that the veterinary health certificates now being issued by the local authorities in India are not acceptable to the importing countries under their regulations. Since there is an active demand for these articles in the United Kingdom, efforts should be made by the Government to facilitate the export of these articles to United Kingdom and the foreign countries.

Glandular and allied products.—A large number of miscellaneous products used in medicine are manufactured from parts of animal body, *i.e.*, glands, etc. Some important products are pepsin, pancreatin, adrenalin, etc. Pepsin aids digestion. Pancreatin is used for peptenising feeds for infants and invalids and is obtained from hog's belly. Recently it has been demonstrated that the lining membrane of the pig's stomach contains haemopoetin and is now extensively used for pernicious anaemia in man. Adrenalin is a powerful heart stimulant and is obtained from the glands that are located just above kidneys. It is highly valued for medicinal purposes. It is a very costly product as a very small amount of adrenalin is obtained from a large number of animals.

Most of the glands employed for medicinal purposes belong to that part of animal usually considered as offal which include the brain, heart intestines, kidneys, various lymphatic glands, mammary glands, ovaries, pancreas, parathyroids pituitary and prostate and thyroid glands, etc., etc.

The thyroid gland is located on the side of the windpipe directly below the animal's larynx. It is deep purple in colour.

The pituitary gland is located at the base of the brain. It is protected by a cavity in the skull. The pituitary gland is about the size of a pea and is either grey or yellow in colour.

The adrenal glands, two in number, are found in every beef animal, located on one side of the kidney. The adrenal glands are about the size and shape of a bean and are dark red in colour. They are highly valuable. One of their principal uses is in the production of epinephrine used to stimulate heart action during surgical operations.

The thymus obtained from veal is located in the neck near the chest cavity. This gland is cream coloured and is used as a commercial food.

Insulin is obtained from the pancreas or sweet breads (not to be confused with commercial sweet breads) and is used in treating diabetes, while pepsin is obtained from the pyloric end of the hog stomach.

Nearly all meat packing plants in United States collect glands, most of them using double jacketed containers with solid carbon dioxide to preserve them. All glands are collected and frozen within 30 minutes of killing so as to be fully effective for medicinal purposes. Extraction is usually effected by the use of small spoons or by forceps.

Looking at the huge livestock population that we have in our country it can be safely said that India can meet all the demand for glandular products. Such a demand for glandular and hormone preparation is increasing at a tremendous pace all over the world. According to a well known authority on the subject, India has vast potentialities for preparation of biological products from the endocrine glands of animals slaughtered in the slaughter-houses, but this potentiality was not generally being utilised in the country anywhere, as the slaughterhouses in this country do not have any cold storage arrangements, which are essential for preserving the glands from the time of slaughter to the time of removing to the factories.

Fats, *i.e.*, lard, tallow, etc. are other important by-products of the meat industry. In the United States of America, Oleomargerine is a big industry. It is obtained from oleo oil which in its turn is prepared from prime beef fat. Soap industry is complementary to oleomargerine industry. No estimates of the total value of these products in the raw state are available, but in the United States, the returns from the raw products of beef in the packing industry are said to amount to nearly one-sixth of the total value of the meat. Under normal conditions, they more than cover packer's operations and selling expenses and, in fact, constitute the industry's chief source of profit.*

From this necessarily brief survey of the trade in offals and by-products, two important facts emerge. In the first place it is clear that, from the standpoint of technique, all waste is avoidable. The second fact is that the degree in which it is economically possible to utilize these commodities varies with the degree of concentration of the raw material. In some of the foreign countries, where meat packing is conducted by a few huge concerns, the intensive utilization of by-products, especially the inedible supplies, is carried much further than in this country where slaughtering is still carried on to a very large extent in small, scattered, unrelated slaughter-houses.

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* Rudolf A. Clemen. By-products in the Packing Industry. 1927.

There can be no doubt, that the development of up-to-date public slaughter-houses or large centralized slaughtering establishments in the lines suggested earlier in this Chapter would make possible the more efficient utilization of by-products and save enormous quantity of raw material which are now annually lost. Even under present conditions, however, much might be done by joint action by the meat trade and the ancillary trades engaged in the processing and manufacture of by-products to facilitate the collection and improve the methods of handling the raw material. It is understood that the Council of Scientific and Industrial Research is establishing various national laboratories in different parts of India. It is hoped that they would undertake the work in one of their laboratories on the above lines and develop the manufacture and standardisation of various animal by-products with a view to eliminate waste which is still taking place in this country. Likewise it is hoped that the Indian Council of Medical Research and Indian Council of Agricultural Research will interest themselves in seeing that the vast potentialities for preparation of biological by-products from various glands of animal slaughtered in the slaughter-houses are efficiently utilised. Thus, in science lies the salvation of our people, not only in the field of food, but in every field of human activity.

K.—Finance of meat marketing.

There is no organised system of finance in marketing of meat in this country. From ancient times *Shahukar* and *Bannia* has been the main stay of the producer's financial requirements. The system of borrowing money from Co-operative or other bank is not very much prevalent in the meat trade, though the butchers may occasionally receive help from banks against some security.

Generally speaking, butchers depend upon their own resources for the purchase of their slaughter stock and other incidental expenses. In a few cases purchase of food animals are made on credit without interest from brokers or whole-sale livestock dealers, when accounts are cleared within a week or so. They are also known to take advances from hide and skin merchants on the understanding that they will sell their hide and skins to their creditors at a slightly reduced or cheap rates fixed in advance. No interest is charged avowedly but corresponding adjustment is made in the price of hides or skins as the case may be. Occasionally the butchers resort to loans from local *Shahukars* or wholesale merchants with whom they may have long established business relations.

Urban butchers are better placed than their rural cousins in matters of obtaining loans. They are generally able to secure better prices for their meat and when in need of money they can always take short loan from some money lender.

The wholesale dealers, besides giving loans to producers and dealers for purchase of food animals have to arrange for running their day to day business. A good portion of their daily turnover remains outstanding with customers for at least a month or so, when only their regular clients clear their accounts. For handling 8 to 10 maunds of meat per day, a butcher has to invest something like 600 to 1,000 rupees and this sum remains invested throughout the year. In most cases it is his own money but sometimes it may be borrowed from money lenders or some bank.

The amount of loan, rate of interest, period of repayment varies from butcher to butcher and largely depends upon the quantity of meat handled daily or monthly and the general status, reputation and previous connection of the debtor.

L.—Possible developments in meat marketing.

It has been shown in the previous pages that the production of raw meat, at any rate, in important towns and urban areas is carried out under the supervision of Local Boards and Municipalities who have erected meat markets and slaughter-houses in their respective jurisdictions. Though a few municipalities maintain some sort of supervisory staff for their markets and slaughter-houses, yet for want of the requisite trained staff they have not been able to serve as efficient agencies for the improvement and development of meat industry, amelioration of the socio-economic position of the butchers and above all in increasing meat supplies in the country. Generally, arrangements exist for the cold storage of meat either in the premises of the slaughter-houses or in the markets. The meat except in case of few big cities is carried from the slaughter-houses to the markets or butchers' shops in horse or bullock driven carts in an exposed or semi-exposed condition. The production of meat is scattered on small scale and individualistic with the result that improvement in any direction cannot be readily effected.

Schemes and programmes, although excellent in themselves and put through with the best of intentions, are not apt to enlist the co-operation of the butcher who is the man to be reckoned within the analysis. To turn the butchers inertia to enthusiasm, complacence to constructive endeavour, is as much the duty of the State as the promotion of research, marketing and other activities.

In all European and American countries where the meat industry has been properly developed, the State has had to play and is playing a very important part in supplying the necessary machinery for fundamental research, experimental and pilot exploration work.

Technological research is necessary not only in regard to the equipment and gear used in slaughtering but also in connection with the proper handling, preservation and transport of fresh meat, preparation of processed meat products and the manufacture of manure and other by-products.

In the United States of America the meat packing factories are conducted on most modern lines and the methods of slaughtering, dressing, packing, transport and distribution, reflect high technological knowledge, skill and management. The equipment and methods employed are also very highly evolved, with mechanization carried out to the maximum possible degree. With the development of this highly efficient productive machinery the methods of handling, distribution and utilization of meat have received equal, if not, more attention. Not a fraction of meat supplies, not even the trimmings is wasted. With the well organised and developed machinery for canning, freezing and cold storage the handling of meat over long distances has been made possible.

The public in India, on the other hand has so far displayed little interest in matters associated with the hygienic production and handling of the flesh they consume. Few are aware that there are many animal diseases which are communicable to man through eating meat of diseased animal. In fact, they take it for granted that the law of the country provides for the inspection of all meat intended for human food, and consequently they do not deem it necessary to make further investigation into the matter but are content to remain ignorant of the fact that nearly the whole of the meat consumed in the country is only partially and inadequately inspected and that at many places the system of meat inspection is in name only. Public opinion requires to be educated and awakened to the recognition of the importance of maintaining the purity and wholesomeness of meat supplies. This can be done by suitable propaganda *i.e.,* leaflets, lectures, etc. and training of the present meat inspectors at the Veterinary Colleges. Apart from this the butchers and those employed in the meat trade should also know the scientific side of their work. There are besides other losses. The hides, for instance are badly spoiled during the flaying operations, many useful by-products wasted and meat mutilated during the dressing of carcase.

In view of the very backward nature of the meat industry and the indigent condition of butchers in the country and the comparatively very little interest taken by large commercial interests, it is felt that pilot research and exploration by the Central Government in different zones is essential for enabling the State Governments and private commercial firms to start development schemes on an appropriate scale. For the purpose a number of pilot schemes for establishment of Central Slaughter-houses, at the major towns of India—Bombay, Calcutta, Madras, Bangalore, Delhi, Amritsar and Lucknow, etc. to be run through Government agencies, private enterprise or producers' co-operatives, for the production and distribution of meat are suggested. It may be necessary to replace the existing agencies concerned in the distribution of meat by one or two selected agencies even to the extent of granting a monopoly, and constitution of a Meat Marketing Board in a few selected centres, for safeguarding the interests of producers, consumers and distributors and with powers to control the purchase and sale prices. Such an enterprise should have arrangements for cold storage in the big slaughter-houses and should be run on scientific lines, utilising the by-products which now go to waste. Legislation for the creation of Statutory Meat Control which will not only exercise control over production but also supervise marketing and distribution so as to ensure purity of supplies, may also be considered.

A bold plan at solving the complicated meat supply problems of large industrial towns through Government sponsored agencies with the object of adopting up-to-date and modern methods of production, processing and distribution has been suggested by the Miscellaneous Food Industries Panel, of the Government of India, late Department of Food. The plan is very comprehensive in its outlook, and is the first of its kind in this country. The plan with suitable modifications and how the various vexing problems in the organization of the meat supply could be solved are discussed in the pages that follow :

The difficulty of reconciling the principles of Centralized slaughtering, with that of multiple ownership has been successfully overcome in Adelaide, South Australia. The system of Municipal slaughter adopted there, briefly is as under :

The abbatoir is owned by the Municipality and is run by Meat Board representing the butchers and the Municipality. This Board controls the whole process from the receipt of the stock into the abbatoir to the delivery of the meat to the premises of its owners, and makes an inclusive charge for its services. Inedible offals including fats and intestines, are purchased by the Board from the butchers and treated on the premises. This system secures all the advantages of factory method ; the abbatoir is enabled to run at reasonably near full capacity and the best condition of meat on delivery as well as the most economical utilisation of by-products are ensured. At the same time, there is an efficient system by which the identity of carcase and offals belonging to individual butchers is maintained.

It is conceivable that some such solution of the problem may eventually be found in this country as regards slaughtering in the large towns. Here, undoubtedly, economies could be secured and efficiency gained by concentrating the slaughtering at a comparatively few centres conveniently situated. Such larger units have undoubted advantages. In a slaughter-house of substantial size, it is possible to eliminate several wasteful operations, ensure better planning and introduce improved slaughter techniques. Economies which are not available to small slaughter-houses are available to large ones. By its very nature a larger unit of management can diversify its economy and can make a relatively greater contribution to the solution of the country's meat problem. These centres could also serve for the training of the large personnel required for the meat inspection purposes and test and demonstrate the most suitable method of slaughtering and preservation of meat etc.

To sum up the rapid development of meat industry in India depends on a series of innovations such as the establishment of Central Slaughter-houses, rigid and rigorous meat inspection and grading of products, use of suitable modern types of equipment on a large scale for working various sections of abbatoirs, the provisions of ice and cold storage facilities in the slaughter-houses and markets for preservation, storage and regular distribution of the supplies, the provision of the road refrigerator trucks, the improvement in storage conditions at wholesale and retail markets, and utilization of surpluses by up-to-date methods and of wastes and inedible offals by the development of by-products industries.

Such changes will reduce losses and deterioration of the products, make available more regular and larger supplies and while providing an equitable wage to the poor butchers materially reduce the price spreads. Finally, as in all other countries the Centralization of Slaughter would provide the training and recruiting grounds for the personnel required for the Meat Inspection Service of the country.

M.—Plan for re-organisation of the meat industry.

Plan required to safeguard the quality of meat and fully to utilise all parts of the animal.

(1) Though the livestock population of India is the largest in the world, yet we are concerned with meat-products in two ways only. first that they cause no injury to health and second that if animal life has to be taken, no part of the body is wasted. The first responsibility arises because a fairly large percentage of the population eats meat of animals of uncertain health, slaughtered and sold under unhygienic and unsatisfactory conditions. The second responsibility arises because, by far and large, only the flesh of the animal is eaten and valuable by-products are thrown away or put to uses without reference to their value.

Meat trade in the hands of numerous individual butchers.

(2) This state of affairs is inevitable because, though meat in cities and towns is consumed in considerable quantities, its trade which is in the hands of numerous small butchers, renders production and marketing under hygienic conditions impossible. Generally, decrepit and even diseased animals, unfit for any other purpose are slaughtered and sold under conditions of unimaginable squlor, municipal laws notwithstanding. This condition of things cannot be altered solely by recourse to the provisions of law because ordinary law cannot be effective when the offence is so general and is so commonly tolerated.

Plan to improve butchers by economic pressure.

(3) As the consumption of unfit or unwholesome meats must affect the health and reduce the life of a large cross section of the population, it is essential that Government and local bodies take strong

measures to put an end to present state of affairs. We cannot build a great State, if the health of the people is endangered by food which can be improved. Considering that the trade is in the hands of a certain recognised class, the objective has of necessity to be reached progressively. In the circumstances, it is thought that the best plan would be not to interfere with the butchers if they can live by their present profession and conform to the requirements of law. At the same time, alternative arrangements may be provided to serve the needs of the public, and while the butchers may be given every facility to make use of these arrangements, they should not be coerced.

Central Slaughter-house and meat market to provide meat of requisite quality and waste products for factory use.

(4) Accordingly, the plan recommended is that in big cities and towns the Government may construct modern Central slaughter-houses and meat markets and lease them for a period of say five years to one authority or make alternative suitable arrangements.

(5) The following conditions must be satisfied in each centre:—

(*i*) All animals must be examined and veterinary passed before slaughter. This is no doubt done to some extent now, but in view of the number of butchers and the places of slaughter and sale by them, the control is not in any degree effective. On the other hand, enforcement of inspection will be simpler if a large number of animals, belonging to only one contractor or offered for slaughter.

(*ii*) All meat sold is classified and graded for quality, which will be maintained by official testing. For any defections in the quality prescribed, the contractor can be penalised.

(*iii*) All glandular products and inedible offals are processed according to latest methods. The one reason why, at present, there is waste of these products is that they belong to different parties and there is no easy means of collection and no assurance of the supply of raw materials to justify the establishment of the necessary manufacturing units. The assurance of supply will enable the immediate establishment of industries which by utilising what is now wasted should reduce the price of meat to consumers and possibly increase the price of animals to producers. The scope for the by-product industries is so considerable that they will form the most attractive part of the contract.

(6) In return for compliance with these conditions, Government should assure the following:—

Central Slaughter-house and meat market to enjoy monopoly of sale and slaughter in a designated area.

(*i*) In a designated area round the Central Slaughter-house or meat market no other person should be allowed to slaughter or sell meat. This monopoly to the Contracter which he will see is better enforced than to existing bylaws against clandestine slaughter will make the lease attractive. Any butchers rendered unemployed would be absorbed in Central Slaughter-house. In due course, it would by sheer economic pressure lead to the establishment of similar centres by private capital to serve all areas in the cities. However, the beginning may be made in respect of a limited area, so as to avoid the risks attendant on an experiment on too large a scale.

Cold storage for the market.

(*ii*) The market should include a cold store. The necessity for refrigeration is nowhere stronger than in a tropical climate and particularly for an article of such short life as meat. A cold store, in fact, is an essential part of a meat market. This should be included in the lease of the market but the lessee should be allowed to use it for other food, not necessarily meat, if there is room to spare.

Holding pens for the slaughter-house.

(*iii*) Holding pens and shelter sheds must be attached to the slaughter-house. At present animals are brought from a distance and, for want of accommodation, slaughtered immediately, without reference to their state of emaciation and exhaustion. There is avoidable loss of weight, for the butcher, while the consumer is deprived of meat containing its proper constituents.

Factory for inedible offals and other products.

(*iv*) Factories may be installed to produce bone, meat and blood meals particularly so as the inedible offals form a rather inseparable part of the edible meat. In order to make the enterprise attractive, Government may engage to buy a specified quantity of the product for Army and other Government Farms. Likewise processing of casings may be provided. The value of these will be enhanced if better methods of processing are followed.

(*v*) In respect of use of glands, the enterprise can be left to private interest, if the contractor is not willing to undertake it. Similarly, in respect of preparations like rennet, gelatine, meat essences etc., private or co-operative enterprises may be encouraged by technical advice and financial help keeping an eye on the export market.

To start with the scheme may be introduced in a few well selected centres. Its success may justify to its extension to more places. The most suitable places are Bombay, Calcutta, Delhi, Madras, Lucknow, Bangalore, Hyderabad, Patna and Agra. The location of the centre must be determined by the space available in the cities. It may be that in many of them, the space required for the slaughter-house and factories may not be available in the area, in that case, the location of the two may be separate, arrangements being made to bring the meat to market in covered motor vans from slaughter-house outside the city. The cost of the pilot scheme may be borne by the Local Government ; or by the concerned Municipality or by both. It is anticipated that the initial outlay will be covered by the accruing income from the leases. In fact, it will be a very good investment.

Justification for Government enterprise.

In making the above suggestions the necessity of such a scheme may be questioned. Many grounds could be found in justification. In the first place the requirements of public health have already been mentioned. Secondly, unless Government moves boldly and according to a plan, the existing situation cannot be liquidated, as both the local bodies as well as State Governments have their own limitations. Thirdly in post-partition development schemes Government has an opportunity on one hand to employ and keep contented a large body of labour, and on the other to advance the health and wealth of the people.

It may be necessary to provide the necessary technical staff required to instal modern slaughter-houses, markets and factories for the by-products. If the experts are well selected this will more than repay the expenditure on them. There is ample room for research in the matter of canning. This research must be on a high level and the results should be made available to the trade.

The proposals and recommendations above do not cover piggeries. There is very good scope for rearing pigs and processing their meat. There is no meat cheaper to produce than pork, though this does not apply to Indian conditions as there is no large scale production of pig meat in the country. The State Governments, should therefore, set up stud farms to up-grade the indigenous pigs, as also produce a breed of hogs of a meat yielding strain on a large scale with a view to develop into profitable meat industry. In addition piggeries on modern lines may be started in the neighbourhood of the bigger cities, where there is always a considerable demand for pork. Considering that the bacon alone imported into the country in pre-war years was on an average of 10 lakh rupees, there is an assured scope for the industry. The foreign market particularly in the near East is very considerable.

There is a great future for the meat industry, provided Government abandons its present passive attitude and undertakes the cost and risk of experiment which is considered to be well justified. It is further recommended that the Agricultural Department in various States should pay special attention on the rearing and improvement of breeds of sheep and goats.

SUMMARY

Meat has been known to the human race since time immemorial. In the middle ages, powerful butcher guilds were organised in most of the large cities of Europe, and for centuries, represented a significant influence in the life of a community. The Worshipful Company of Butchers of London, England, was founded in 1180 and continued to be a power for several centuries. Statutes on the "profession of butchering" were made in France in the middle of the same century.

The oldest data in the history of meat inspection are the food edicts of the Egyptians which designated certain animals, the hog, above all, as unclean, and excluded their meat as food for man. Mohammedan food regulations, even of today, are similar to the Israelite and Egyptian food laws. The Koran considers both the pig and dog as unclean.

In India the cow is considered as sacred by Hindus and almost worshipped. Much of the religious sentiment attaching to the cow has its origin in the crucial place it occupied in the agricultural economy of the country. To kill a cow or a bullock is a deadly sin in Hinduism.

Importance of meat as food

Meat supplies proteins of high quality and ready digestibility, as also fat—a great energy producing food—and iron, phosphorus and most of the other minerals needed by the body. Many of the vitamins also are found in meat. Proteins are the essential building materials of the body, indispensable to proper growth, repair and good health.

The edible offals such as the liver, kidneys, heart, tongue, thymus and pancreas have been found to be excellent sources of both proteins and minerals.

World production of meat

World meat production in the pre-war years averaged approximately 34 million tons, with Europe (excluding the U.S.S.R.) and North America producing more than 60 per cent of the total. South America produced about 14 per cent, Oceania about 4 per cent and the U.S.S.R. about 9 per cent. The rest of the world combined produced only about 10 per cent of the total.

The 1949 out-put of meat in the major producing areas amounted to about 10 per cent above the pre-war average and substantially in excess of 1948 production.

Europe has long been one of the leading producing areas of the world.

The United States and Canada produce more than 90 per cent of the North American meat output.

South America. Argentine and Brazil produce nearly 85 per cent. of the meat total.

The two principal countries of Oceania-Australia and New Zealand- produced about 5 per cent of the world's total. India's space stood roughly at 1.5 per cent of the total meat output.

Almost 90 per cent of the world meat is consumed in the regions where it is produced and hardly 10 to 12 per cent enters international trade. International trade in meat is very important to a few countries like New Zealand, Denmark, Argentina and Australia who have specialised in production for exports. It is also vitally important to the United Kingdom whose imports of meat are considerably greater than its indigenous production.

Supply

Livestock raising occupies a vital place in India's agricultural economy, and, judged by the population, India is one of the most important livestock countries of the world. Despite all this impressive livestock wealth, little economic use is made of it, with the result that both meat and milk yields are amongst the lowest in the world.

According to the Livestock Census of 1945, pre-partitioned India possessed about 206 million cattle and buffaloes, 43 million sheep, 55 million goats and 3.7 million pigs. The exact figures for the Indian Union are not yet available, but the rough proportion which fell to India's share was about three-fourth of the total in each case.

Commercially, meat is the properly dressed flesh derived from cattle, buffaloes, sheep, goats and pigs which constitute the primary source of market meat in India. Other animals like camels and rabbits are unimportant as producers of meat.

The production of meat is closely related to the total livestock population, number of animals slaughtered and the quantity of dressed meat obtained from different animals. In the absence of any reliable and representative data with regard to the number of animals slaughtered in and outside the slaughter houses and the meat yields obtained for different kinds of animals, the task of computing the annual production of meat has been rather difficult. The wide variations in breeds, size and topographical conditions further complicate the task of making an accurate estimate. Taking all the factors into consideration, however the all-India average yield works out to 169.2 lb. and 293.8 lb. in case of beef cattle and buffaloes; 19.8 lb. and 19.9 lb. for sheep and goats and 64.8 lb. for pigs. These yields are relatively poor when compared with those obtained in foreign countries.

The total annual production of meat in India is estimated at 461,245.2 tons or 125.56 lakh maunds, valued at nearly 76.1 crore of rupees. Inclusive of edible offals, the total amount exceeds 100 crores of rupees per annum.

In composition, beef and buffalo flesh amounts to roughly 36.8 per cent, goat flesh 33.8 per cent, mutton 24.3 per cent and pork only 5.1 per cent.

The pattern of meat production has undergone many changes in the recent years. The production of beef has received a severe set back since the partition of the country in August 1947 and the eventual migration of a large proportion of beef eating population to Pakistan. Total prohibition of cattle in some States and voluntary stoppage of slaughter in others, combined with certain restrictions on indiscriminate slaughter of certain categories of animals, have tended to reduce greatly the production of beef in India.

The large beef producing areas are located in Madras, Bombay, West Bengal, Uttar Pradesh and Bihar. The largest mutton producing States in the order mentioned are Madras, Bombay and Uttar Pradesh. The outstanding goat flesh producing centres are Bombay, Uttar Pradesh, Madras and Rajasthan. Madras, Hyderabad Deccan, West Bengal and Assam are the important producers of pork.

There is no pronounced fluctuation in the production of meat from season to season though climatic conditions do sometimes determine the production to a certain extent. Production is the lowest in summer months, while the peak is reached in winter months.

Reliable data relating to the annual production of meat in previous years are not available. However, one point is fairly clear, *viz.*, that meat production, though on increase, has not kept pace with the increase in human population. Census result show that during the decade ending 1941, population increased by 15 per cent, compared with only 7.2 per cent increase in the number of livestock.* It is also believed that the meat yields of Indian food animals have deteriorated rather than improved during recent years, mostly due to lack of sufficient fodder and pasture grounds.

There is no import of raw meat in India. Considerable quantities of preserved meat, principally ham and bacon used to be imported into India at port towns like Bombay, Calcutta and Madras, chiefly from United Kingdom and United States of America, but their imports have steadily decreased and in 1949-50 amounted to some 1363 cwts. valued at Rs. 3,29,813.

India, had a small export trade of about 536 cwts. in sun-dried beef, called '*Biltong*', before the war, with Burma and Malaya, but the same has not yet been revived.

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* Cattle, buffaloes, sheep and goats

Meat production depends on indigenous foodstuffs, for it is well known that cattle, sheep, goats and pigs when properly fed and maintained, improve their yields, appreciably within a short time. It seems clear that by proper and judicious feeding and management alone of the existing food animals, the production of meat, particularly mutton, goat and pig flesh could be considerably increased in the country, and as conditions are conducive for such an expansion.

Utilization and demand

Meat being a highly perishable article has to be consumed fresh. It can be kept in a fresh condition for a short period through proper processing and storage. Speedy assembling, long distance transport and large scale production being yet undeveloped in India, consumption of meat is mainly confined to the area of its production.

Although a very large percentage of the human population as also that of the food animals is located in the villages, the effective demand for meat and its products is largely urban in character. Many factors such as, purchasing capacity, price of meat, size and composition of the family, occupation, season of the year, race and religion are responsible for variations in the kind and amount of meat consumed.

Keeping in view the fact that a fair percentage of population in this country is vegetarian and that while one class is forbidden to consumed beef and the other is precluded from eating pork, it becomes rather difficult to arrive at an accurate estimate regarding *per capita* consumption of meat in India. However, the average annual *per capita* consumption of meat in respect of India, as a whole, is estimated at 3.4 lb. It varies considerably from tract to tract according to the production of meat and density of population. Madras tops the list with 5.6 lb. per head per annum, followed by Bombay and Himachal Pradesh with 5.4 and 5.3 lb. respectively. Orissa has the lowest consumption, *viz.*, 0.7 lb.

The annual *per capita* consumption of meat in India, as compared to some other foreign countries is much too low ; the highest consuming countries being in order of merit : Uruguay 282 lb., Argentina 266 lb. ; Australia and New Zealand 244 lb. ; United States 154 lb. Abject poverty of the masses and low average *per capita* income in India do not provide any means of purchasing power to the poor with the result that meat is still considered a luxury which only a few can afford to indulge in.

There are no data to show the trend of Indian consumption which in many other advanced countries has considerably improved through State aid and better planning of the meat industry during the last thirty years. In India, the rate of increase in the number of cattle, sheep, goats etc. has not kept pace with that of human population and consequently the consumption may be said to be somewhat on the decrease.

Though meat is consumed all the year round, still climatic conditions determine the demand to a certain extent. The consumption of meat due to its heat producing qualities somewhat decreases during the summer season and increases during the winter months. The other variations depend mainly on local factors. Fairs and festivals also cause temporary rise in demand which is generally met with from meat retained by butchers for their own use.

Bulk of Indians prefer goat flesh and mutton to beef and buffalo flesh. The demand for goat meat is bigger than that for mutton all over the country except in areas which are either predominantly Muslims or have a large cosmopolitan population consisting of Europeans, Anglo-Indians, Parsees, etc. Pork, is very popular in Europe, America, etc. but does not find the same place in India. Its high cost rather puts it out of reach of any but the well to do.

Notwithstanding certain differences of demand in different parts, a general change appears to be in progress in the prevailing tastes of the people in this country. A liking for smaller and leaner cuts in place of fat and heavy joints is observable in the demand for most meats. The urbanisation of the population, the small size of families and the desire for more varied diet have all tended to turn the demand in these directions.

A large proportion of Indian population consumes a diet which is deficient in first-class proteins with the result that there is much under-nutrition as well as mal-nutrition among the poor section of the community both in urban and rural areas. Since meat is a food of high nutritive value, the necessity for augmenting the supply of this vital subsidiary food to ensure a balanced diet to an average adult in India is now more important than ever.

Prices

The main factors which influence or govern the price of meat at a particular place are : (*a*) the type of flesh, (*b*) freshness and quality of flesh, (*c*) selected cuts and joints, and (*d*) intensity of demand in relation to supply.

Due to restricted supply and limited demand, pork invariably fetches the highest price. Goat flesh and mutton prices are always higher than beef and buffalo flesh.

The basis of price quotation is mostly per lb. or per seer, which sometimes varies in different areas. Only in few big municipal towns, standardised weights are used, otherwise discarded and worn out weights, as also stones which more often than not, weigh less than the stipulated quantity are employed for weighing the meat, sold by the butchers.

As a rule, urban butchers get better prices because their meat is cleaner and better and supply is more regular and timely. In the cities the meat prices are higher in the mornings than in the evenings. In the rural areas meat prices are lower than in the vicinity of towns or urban areas.

Big hotels, messes, clubs, hospitals, etc. usually enter into yearly contracts with butchers for their meat supplies. In general, wholesale and retail prices do not undergo any substantial variation except occasionally during fairs and festivals.

Meat prices have increased by 200 to 300 per cent. during the last few years, mainly due to conditions created by the World War II and partition of the country. The increase has however been particularly spectacular at the port towns and other important stations.

The localised character of meat demand, and the absence of imports, exports or big trade in meat have precluded the butchers and others from maintaining a proper market intelligence service regarding prices, arrivals, stocks etc. The only semblance of intelligence provided in this connection is the weekly or fortnightly price bulletins issued by certain important municipalities like Bombay, Calcutta, Madras, Delhi etc. for the guidance of the local consumers. The present machinery for collecting and interpreting these statistics is defective and cannot form the basis of sound planning and development.

Preparation for market

The food value of meat may be impaired through any change in its composition due to natural or other causes and its quality may be enormously affected if it is not properly and carefully prepared for the market.

Inspite of the remarkable developments that have taken place in meat industry in the progressive countries of the world, the production of safe, clean and wholesome meat supply has been and still is attended, with great difficulties in India, and this is particularly noticeable in rural areas.

Unlike European and American countries, food animals are not especially prepared or subjected to fattening, etc., prior to marketing, except in a very few cases where sheep alone are specially fattened on gram, etc. for private slaughter on occasion like *Id* and other festivals.

All food animals such as cattle, sheep, goats, etc. are slaughtered according to certain religious rites, more popularly known as '*Halal*' and '*Jhatka*'. The former one is largely practised by the Muslims and latter by the Sikhs and some of the other non-Muslim communities.

Owing to physical difference, between the different kinds of food animals, the slaughtering methods vary to a certain extent from place to place, but the usual one is what is commonly called 'neck stabbing' which consists of making a bold incision in the neck with a big sharp knife, severing the jugular vein and other main blood vessels and thus bleeding to death.

The two essentials in the slaughter of food animals are that they shall be despatched in as humane a way as possible without unnecessary suffering and that the bleeding of the animal shall be as complete as possible. Many foreign countries, therefore, adopt various mechanical and non-mechanical methods of producing insensibility in the animals before actually slaughtering them.

The purpose of meat inspection at the slaughter-house is to minimise the risk of meat which is diseased or otherwise unwholesome being offered for sale for human consumption. There are various febrile and other conditions such as pregnancy, parturition, skin diseases, nasal discharge, exhaustion etc. etc. which call for vigilant ante-mortem examination as they affect the quality of meat a good deal. For instance animals suffering from excitement, fatigue or exhaustion when slaughtered without any rest do not bleed properly with the result that the keeping quality of the meat is greatly reduced. Ante-mortem inspection of food animals, is thus, highly important and a valuable safeguard to the health of the meat consumers.

There is no standard method of flaying and dressing a carcase and it varies from place to place. Flaying and dressing is an operation which requires considerable skill and experience and if performed improperly, ruins the carcase and, causes monetary loss to the owner. Notwithstanding this, at present, there is nothing to prevent inexperienced or amateur flayer and dresser, taking independent charge at a slaughterhouse and causing damage to the carcase.

After an animal is killed, flayed and dressed, the carcase must be allowed to cool off. It is essential that the animal heat should be allowed to escape before the carcase is transported to meat market, as this helps to retain its keeping quality and good appearance.

The value of the meat depends to a great extent on the appearance and shape of the cuts and any wrong cut lowers so much the value of the meat. The variety of cuts to be made depends on the weight, grade and type of the animal and the cuts which are in demand.

Several classes, grades and qualities of meat are recognised in the trade but there are no well-defined grades with specifications to indicate the various quality factors. Classifying involves sorting on the basis of sex, age and weight, while grading is sorting on the basis of conformation, finish and quality. Although classifying and grading are complementary terms, they are separate and distinct phases of the standardisation process. Classification necessarily proceeds grading.

The meat carcases after inspection in some important towns are graded as first, second and third. Generally speaking, the carcases of young mature and of good conformation fall under the first category, and the carcases with little fat and middle age are placed in the second category. The meat of lean and emaciated animal is graded as third.

Sound meat should be firm and fine in grain. It should have a smooth, velvety touch and should be full of sap. It should not pit upon pressure of the fingers, should be of a bright uniform colour, and slightly mottled by fine lines of fat interspersed with the lean

There should be a pleasant fresh smell from meat. A skewer thrust deeply into the flesh should have no unpleasant or disagreeable odour when withdrawn. The fat should be hard and ivory white and should not be gelatinous and watery.

The soundness of meat depends upon a large number of factors and its determination requires a great deal of experience and skill. The breed, sex, age and food of the animal and the way in which a carcase is flayed, dressed and handled, all go to make the quality or soundness of meat.

The purpose of meat inspection at the slaughter-house is to minimize the risk of meat which is diseased or otherwise unwholesome being offered for sale for human consumption. The system of meat inspection in India, as it is to-day, is not only very lax but with few exceptions, irregular, haphazard and perfunctory with the result that in most of the places, animals are slaughtered and sold under conditions of unimaginable squalor, municipal laws notwithstanding. The production takes place, particularly in the country-side, on a very small scale in innumerable and scattered holdings, which makes the control totally ineffective. In the United States of America and other foreign countries the Meat Inspection Service is entirely manned by the Veterinarians and the meat inspection laws there virtually make these officers supreme umpires in all questions involving wholesomeness of meat animals or meat, sanitary conditions of slaughter-houses and packing plant and all phases of meat processing. The efficiency of this service is widely recognised and the public has full confidence that any piece or package of meat which is marked "Inspected and passed can be purchased with complete assurance that it came from a healthy animal and was prepared under complete sanitary conditions. Unfortunately in India, for want of trained personnel and other difficulties, the standard of meat inspection is not very high and leaves room for considerable improvement.

Preservation of meat on any large commercial scale is not practised anywhere in India. Pig flesh is preserved and processed here and there into different products such as ham, bacon and sausages but these products are still considered as luxury foods and as such have very limited demand.

A number of dehydration meat factories were sponsored by the Food Department of Government of India during the last war to cater mainly for the needs of the Army but this industry has become obsolete due to lack of civilian demand.

Assembling and distribution

The problems of assembling and distribution which confront the meat trade are in general similar to those prevalent in case of other agricultural commodities. The perishable nature of meat and the fact that due to religious scruples, only the butcher class, mostly drawn from Muslim community, deals in this business has, however, given a special colour to this trade.

The primary producers of meat are not only extremely poor but also backward, illiterate, and with narrow outlook, on which account the production takes place not only on scattered and small scale but also in a casual and irregular manner. This has hampered the growth of meat industry with the result that large scale organisations such as meat factories, producers' co-operative societies etc. which have developed so well in other countries are conspicuous by their absence in this country.

The functionaries engaged in the meat trade may be divided into three main groups *viz.*, (*a*) producers, (*b*) butchers and (*c*) vendors. The first include the rural producers of livestock and the second all those butchers owning meat stalls in Municipal, Cantonment and other markets or assembling centres, and the third comprises of meat retailers or vendors who dispose of their marketable surplus of meat by hawking from door to door.

Many towns and cities have meat markets where meat is assembled and sold but, generally speaking, most of these markets are insanitary and ill-equipped and leave much room for improvement. Similarly most of the slaughter-houses are objectionably situated and cause much nuisance or else are unduly public. While the slaughter-houses maintained by some of the large municipalities are tolerably good, others and those in the rural areas are simply shocking and highly insanitary totally lacking in essential facilities like light, water, drainage and protection from flies, carrions, crows, rats, mice and other vermins.

There are certain rules and regulations for ensuring that only clean and wholesome meat is put on the market but they are honoured more in breach than in observance, because their enforcement has been far from satisfactory. The practice of leaving meat exposed and uncovered to be contaminated by dust dirt, flies etc. is common and a potential source of danger and disease, particularly so in hot weather.

There are not very many serious mal-practices prevalent in the meat trade, excepting that in certain places, stale meat is palmed off as fresh and in other places buffalo flesh is passed off for beef, and mutton and goat flesh is mixed and sold together. Most of the consumers, as a rule, are not able to differentiate between fresh and stale meats and the butchers who know this, always endeavour to gamble on the ignorance of the buyers. In some places like Bangalore thin fat spreads are used on lean carcases in order to upgrade the meats.

Although in recent years, butchers have become more enlightened and educated, as a class, they are still rather conservative and slow to adopt progressive methods in their trade. Though a few butchers unregistered associations, function here and there they have not done anything to ameliorate the conditions of the butchers or effect improvements in any direction in the meat trade. In many advanced countries, there are trade associations to look after the interests of their constituents. The associations are highly organised and extremely efficient bodies exercising a profound influence upon the industry which they represent. Amongst others they keep members fully informed on the livestock and meat situations, Government activities and regulations, and other important matters, undertake advertising on behalf of the meat industry and provide in many cases research institution service for members covering control of the products, dissemination of information on research and scientific developments having application on the industry.

Co-operative Societies have not played any part in the assembling and distribution of meat in India. However, there would appear to be ample scope in this direction and it is felt that the meat handled by these co-operative societies could with advantage be sold direct to big customers like hospitals, hotels, messes army authorities, etc.

In all the progressive countries of the world, great importance is attached to Co-operative Marketing as one of the surest means of not only bettering the lot of the butchers but ensuring the quality of the meat placed in the market. Co-operative and Marketing Societies help to obtain better returns, encourage the members to produce quality and graded meat and facilitate installing of cold storage etc.

The means of transport employed for conveyance of meat are rather primitive, *e.g.*, head-load, shoulder-slings, bullock carts and *tongas*. Motor or bullock driven covered meat vans are used only in a few big towns. Bicycles being cheap and speedy are quite popular. The transport actually used, however, varies from tract to tract and depends upon local customs; the quantity and type of meat to be carried and the distance which has to be travelled. Refrigerated transport which is so necessary in a tropical country like India and particularly for an article of short life as meat has not received so far any attention.

Meat being highly perishable, requires very careful handling. Following production, meat may receive further contamination at any stage of its handling in the slaughter-house and during its journey from there to the distributor or to the consumer, depending on the cleanliness of the containers used for handling meat, conditions of transport and atmospheric temperature, humidity etc. The butcher in his turn by the use of dirty hands, knives and cutting instruments can add considerable contamination to the meat.

The containers used in the meat trade are anything but satisfactory. Meat is carried mostly loose or in old, tattered baskets of all conceivable shapes and sizes, generally exposed to flies, dust, etc. In other cases the carcases are stacked or piled up one upon the other in carts, and tongas. Due to this rough handling certain portions of the carcases get bruised with the result that bacterial deterioration sets in quickly and flesh becomes unfit and unwholesome.

Most of the meat is ordinarily sold as fresh and as such butchers do not have to store meat for long periods. In spite of this, some storage becomes inevitable. It is, therefore, sometimes stored in ice. This is mainly done to either meet some sudden rise in demand on festivals like X'mas, Easter, Id, etc. or sometimes when meat is left over unsold. Generally speaking, the period of storage in case of fresh meats does not exceed 12 to 24 hours. In rural areas, in some cases the unsold meat is covered with a pieces of cloth and kept in baskets or hung up from 'iron hooks'. The total loss caused in storage in India is computed roughly at 25,000 maunds valued at Rs. 15 lakhs. The butchers seem to be yet ignorant of the benefits of the cold storage in the meat trade.

No attention has been paid to the conserving and utilizing of the by-products like blood, bones, guts, etc. In rural areas all the blood, ingesta, horns, bones, guts, etc. usually go to waste. In urban slaughter-houses, only in few cases blood and guts are collected and utilised for commercial purposes.

In practically all slaughter-houses and meat packing establishments in United States of America, the utilization of edible and non-edible offals and other by-products of animals slaughtered, has become an industry in itself. This greater utilization of the by-products has made it possible to pay the producer an increased price for the livestock purchased and to sell the finished products to the consumer at a cheaper price.

Science has found new ways to use by-products, bristles make brushes, hair makes upholstry paddings. Bones, blood and scraps go into animal and poultry feeds. Fats and lanolin are the base of many cosmetics, creams etc. Gelatine and glues are put to many uses. Soap, glycerine, blood meal etc. are all prepared from by-products. The lard has other uses than to cook with. It is used for illumination as lubricant and for manufacturing chewing gums, candles etc. Life has been lengthened for people suffering from diabetes, anaemia and other diseases by the use of drugs such as insulin, liver extract, pepsin, adrenalin, etc. made from animal glands etc.

Unfortunately in India, the by-products still continue to be unexploited in the meat trade. All the demand for glandular products can easily be met looking at the huge livestock population that we have in this country, but this potentiality is not being utilised anywhere, fully, as the slaughter-houses do not have any cold storage arrangements, which are essential for preserving the glands from the time of slaughter to the time of removing to the factories and the slaughtering is still carried on to a very large extent in small, scattered, unrelated slaughter-houses.

Reorganisation of the meat industry

Though the livestock population of India is the largest in the world, yet we are concerned with meat and meat-products in two ways only first injury to health and second that, no part of the animal is wasted. The first responsibility arises because a fairly large percentage of the population eats meat of animals of uncertain health, slaughtered and sold under very unsatisfactory conditions. The second responsibility arises because, by far and large, only the flesh of the animal is consumed and valuable parts are thrown away or put to uses without reference to their value.

This state of affairs is inevitable because, though meat in cities and towns is consumed in considerable quantities, its trade is in the hands of numerous small butchers, who pay no heed whatsoever, to hygienic production of meat. As the consumption of unfit or unwholesome meats must affect the health and reduce the life of a large cross section of the population, the first pressing necessity is to purge the country of a large number of small, scattered and highly insanitary and uncontrolled slaughter-houses spread all over and to construct modern Central Slaughter-houses, in all cities and big towns and lease the same for a period of, say five years, to one authority on certain conditions. It is suggested that the scheme should be tried in the first instance, on an experimental basis, at 9 centres, namely at Bombay, Calcutta, Delhi, Madras, Lucknow, Bangalore, Hyderabad, Patna and Agra.

The reorganisation plan envisages that all animals slaughtered would be examined and veterinary passed, meat sold would be classified and graded for quality and all glandular products and inedible offals would be processed. Further, the meat market would include a cold store and the central slaughter-house facilities to process by-products to the best advantage.

To sum up, the rapid development of meat industry depends on a series of innovations as the establishment of Central Slaughter-houses, rigid meat inspection, use of suitable modern types of equipment on a large scale for working various sections in abattoirs, the provision of ice and cold storage facilities in the slaughter-houses and meat markets for preservation, storage and distribution of the supplies, the provision of improved or insulated meat-vans, the improvement in storage conditions at wholesale and retail markets, the inspection and grading of meat and products and utilisation of surpluses by up-to-date methods and of wastes and inedible offals by the development of by-products industries.

Such changes will reduce losses and deterioration of the products, make available more regular and larger supplies and while providing an equitable wage to the poor butcher, materially reduce the price spreads. Finally, as in all other countries the development of the Central Slaughter-houses would provide the training and recruiting grounds for the personnel required for the Meat Inspection Service of the country.

It must, however, be remembered that all schemes and programmes, although excellent in themselves and put through with the best of intentions, are not apt to enlist the co-operation of the butcher who is the man to be reckoned within the analysis. To turn the butcher's inertia to enthusiasm, complacence to constructive endeavour, is as much the duty of the State as the promotion of research, marketing and other activities.

CONCLUSIONS AND RECOMMENDATIONS

Production

The annual value of meat along with edible offals produced in India is estimated to be over 100 crores of rupees. The importance of the industry should not, however, be judged merely from this figure. Meat is vitally important to the Indian population because their diet is deficient in first class proteins and these could easily be obtained from meat. Therefore, from economic, nutritional and public health points of view, the meat industry is of considerable importance to the country and deserves a lot more attention than it has received in the past.

There appears to be a considerable agitation, in a section of the population, for complete ban on slaughter of cattle in India. This survey, however, has indicated that such a ban on total slaughter is bound to have serious repercussions on the different branches of livestock industry of the country. The problem requires to be viewed from a practical economic angle. The correct solution would then seem to be to preserve useful cattle at all costs and so to improve the animals' health and breed as to ensure for the country in the course of time to come all the milk it needs and all the efficient animals its agriculture requires and yet, leave an adequate surplus to yield good quality meat, hides, skins and bones. *It is, therefore, recommended that an Expert Committee consisting of officials and non-officials conversant with meat and allied livestock industries should be appointed to enquire into the possible effects of the total ban on the slaughter of cattle with particular reference to the following :—*

(*i*) *The direct economic loss, present and potential that may be caused to the country as a result of the ban, on the quality, quantity and value of meat and its by-products such as, hides, bones, guts, horns, hoofs, blood, etc.*

(*ii*) *The loss that is likely to accrue to the country by the increase in the number of uneconomic or unfit cattle in the course of the next few years and its effects on the existing livestock fodder supplies.*

(*iii*) *The effect of such a ban on the health and welfare of that section of the Indian population, particularly the economically backward part of it, who were now depend largely on this cheap source for the supply of animals protein in their diet.*

India has excellent potentialities for expansion of its meat production, particularly mutton, goat and pig flesh. The conditions are conducive for expansion as sheep and goats are easily reared, while pigs are raised with a little care or feeding. At the moment, pig raising is confined to poorer sections of our population and no particular care is taken to feed them.

It is, therefore, recommended that the State Government should set up stud farms to improve the indigenous breeds with a view to producing animals of high meat-yielding strains on a large scale in order to develop a profitable meat industry. In addition, piggeries on a more scientific and modern lines may be started in the neighbourhood of the bigger cities, where there is an increasing demand for pork.

The general condition of livestock (food animals) has much to do with the quality and quantity of food available in the country. As it is, India is not only deplorably deficient in animal feeds but has nearly 14 million useless and unproductive animals which on a conservative estimate of 8 lb. per head per day, consume 18.2-5 million tons of fodder which at Rs. 56 per ton works out to Rs. 102.2 crores annually.

It is, therefore, recommended that special attention should be given to better breeds, better methods of feeding, better control and more intensive action against animal diseases and better utilization of grass lands and pastures, with a view to improving the efficiency of production and consequently increasing output per animal. For it is well known that by judicious feeding and careful tending alone production can be increased substantially.

Consumption

Meat has not yet received sufficient recognition as an important food item and has hitherto been regarded as a luxury for the town-dwellers. The nutritional importance of meat is also practically unknown. For these reasons, the *per capita* consumption of meat in the Indian Union is very low, hardly 3.2 lb. In many foreign countries large sums are annually spent on 'consumers education' and sustained and successful efforts are made to derive home successfully to the consumers the value of meat and its products. Happily, there is not the same prejudice in India today against meat eating, particularly mutton and goat flesh, as existed before. Efforts to increase production are unlikely to bear fruit if steps are not simultaneously taken to increase consumption.

It is, therefore, recommended that extensive propaganda may be carried out to educate the people as regards high nutritive and protective value of meat and on the advisability of its increased consumption in their daily diet.

Meat in India, particularly ham, bacon and sausage is preserved on small scale by methods which may well be described as other out-of-date, crude and insanitary.

It is, therefore, recommended that improved methods be evolved for processing pig meat and better types of cures introduced which may be standardised as far as possible. The Central Food Technological Institute, Mysore may with advantage explore these possibilities.

Prices

There is practically no information available with regard to the prices of meat prevailing at different markets in the country excepting weekly or fortnightly price bulletins issued by few major municipalities.

It is recommended that a beginning should be made by broadcasting the meat prices prevailing in principal markets. Such a service would give the meat industry including livestock producers adequate and equal opportunities for understanding past and present conditions and future prospects in the industry.

The weights at present used in the meat trade are unsatisfactory and unsuitable. In many places standard weights are not in use. In others, stones of different sizes, in many cases worn out a good deal, are used as equivalents to standard weights for weighing purposes.

It is recommended that the use of standard weights in the meat trade and a more frequent inspection of them should be rigidly enforced by the concerned departments.

Preparation for market

It has been shown that the resting of food animals before slaughter is very necessary and desirable and, where the physical conditions at the slaughter-houses are suitable and the animals are skillfully handled the balance of advantage in relation to the quality and the keeping property of meat lies in resting cattle, and possibly sheep, goats and pigs, for at least 12 hours before slaughter.

It is, therefore, recommended that wherever suitable paddock or lairage accommodation is available or can be provided, food animals should be rested for at least 12 hours before slaughter unless slaughter takes place very shortly after arrival and after a relatively short journey.

Flaying and dressing may cause considerable monetory loss if not performed carefully. Many carcases are reduced in value and utility due to carelessness in these operations. To some extent, the reasons why the standards of flaying and dressing do not improve readily in India are that the butchers, flayers dressers are all too backward and ill-informed to realise the losses caused by bad flaying and dressing. Besides general carelessness, engagement of inexperienced flayers and dressers, lack of supervision over them, use of unsuitable knives, inadequate arrangements for suspending or hoisting up the carcases, are some of the factors which are responsible for improper and defective flaying and dressing of meat carcases in India.

The environments and facilities under which the butchers, flayers and dressers have to work have considerable influence on their efficiency. Meat cannot be inspected efficiently in a slaughter-house unless lighting, space and other facilities are adequate. Many slaughter-houses are ill-equipped and, in consequence, meat inspectors have to work under extremely difficult conditions. The buildings, therefore, should be suitably designed for the orderly handling of the animals and their carcases, organs and viscera and slaughter-houses should be so equipped as to secure the highest possible standards of cleanliness.

It is recommended :—

(1) *that Government of India, should appoint a Central Slaughter-house Committee, consisting of official and non-official members conversant with slaughter-house designing and representing different interests in the meat industry to—*

(*a*) *prepare and draw plans and estimates of buildings, equipment, etc. for slaughter-houses of various sizes and types suitable for Indian conditions so as to eliminate all waste and secure full utilization of by-products.*

(*b*) *frame model rules for the operation and control of slaughter-houses, on the lines of the " Model rules for meat inspection and the inspection of slaughter-houses and their regulations ", prepared and circulated by the Indian Council of Agricultural Research in* 1939 ;

(*c*) *prepare rules for the examination of flayers, etc., conditions of licences, renewal of licences etc. for flayers, dressers etc. operating at the slaughter-houses, and*

(*d*) *draw a set of instructions, on flaying and dressing of carcases for the benefit and guidance of flayers, dressers and demonstrators engaged on peripatetic demonstration work. These might be printed in as many regional languages as possible in the form of pamphlets suitably illustrated.*

(2) *The recommendations made by the above Committee together with the plans, estimates, model rules, etc., may be printed in a report form for the guidance of Municipalities, Local Boards and State Governments.*

(3) *Municipalities and Local Boards responsible for maintaining slaughter-houses should remodel and re-equip them, set up the necessary organisation for their control, and licensing of flayers and dressers after a proper test.*

(4) *Peripatetic demonstration parties for imparting practical training should also be organised as early as possible to train rural butchers in up-to-date improved methods of flaying and dressing. In this connection, Veterinary Officers posted in rural areas can do a lot to improve the conditions by doing propaganda and demonstrating improved methods. For their guidance a suitable bulletin may be prepared on the subject.*

Quality control of market-meat

The country abounds in unlicensed and practically uncontrolled private slaughter-houses. Most of the slaughter-houses and meat shops are also shockingly insanitary. There is a strong feeling amongst consumers the official control in this respect has been very lax. Control of the number of slaughter-houses and the provision for a more rigorous and rigid inspection of not only slaughter-houses but all the other places where meat is sold, is, therefore, both urgent and essential.

The enforcement of a rigid system of meat inspection would be made easier if carcases which had been inspected and passed as fit for human consumption were marked by a meat inspector.

It is recommended that since the enforcement of food and sanitary legislation rests entirely in the hands of Municipal and Local Board authorities, they should be more vigilant in rigidly enforcing proper supervision and regulation of meat establishments and slaughter-houses in order to safeguard the health of consumers and to eliminate unfair trade practices. Further, regulations be made providing for the marking at the time of inspection of all the carcase meat passed for human consumption.

The public in India has so far displayed little interest in matters associated with hygienic control of their meat supplies. They do not know that there are many animal diseases which are communicable to man through eating diseased meat. In the matter or administration of these regulations the position is still more discouraging. Sanitary legislation in respect of slaughtering is all in name and abortive in its practical utility. Not only should standards of inspection be set up for the country as a whole, but there should be uniformity both in the methods and administration of such inspection. The establishment of conditions in which meat inspection can be put on a statutory basis should be recognised as one important aspect of the arrangements to be made for the future slaughtering of food animals and the distribution of home-killed meat.

It is, therefore, recommended that as soon as it becomes practicable to do so, the departments concerned may, in consultation with local authorities, examine in detail the means of operating a compulsory system of meat inspection in India.

The basic recommendation for the immediate implementation is that ante and post-mortem inspection by duly qualified Veterinarians at all the urban slaughter-houses in the first instance should be made compulsory and rigidly enforced by various important municipalities in India. Since, however, due to dearth of technical trained personnel, it has been found impossible by the municipalities to get suitable hands, it is further recommended that the State Governments should provide *a short course of theoretical and practical training in meat inspection so as to enable the nominees of municipalities and other local bodies to qualify themselves as Meat Inspectors.*

Further the model bye-laws concerning the meat inspection, construction and cleanliness of slaughter-houses and slaughter-house equipment etc. issued by the Indian Council of Agricultural Research (Appendix XVIII) may be extended and made more comprehensive, so as to secure greater uniformity of methods and standards of meat inspection.

Most of the meat is purveyed and distributed under conditions filthy enough to creat dislike in the minds of many consumers. The sale of meat in the open air, exposed to all contamination, like dirt, flies, crows, vermins, etc. is both dangerous and undesirable and should be brought immediately to an end.

It is recommended that all the butcher shops and meat establishments should be registered by the local authority of the area in which they operate; registration should be conditioned upon the suitability of the premises used for the preparation, storage and sale of meat.

With high productivity, quality control—preferably as a laboratory function and supplement to visual inspection of carcases, should be regarded as essential for the maintenance of a high standard. Laboratory tests are generally not at present undertaken in this country although their importance is becoming more widely appreciated.

It is, therefore, recommended that laboratory accommodation and facilities should be provided at all new slaughter-houses and, whenever practicable, at existing slaughter-houses, to enable meat inspectors to carry out routine laboratory tests covering the examination of smears and tissues.

Assembling and distribution

The assembling and distribution of meat is generally done on a small scale and in an unsatisfactory manner by numerous persons. To improve the meat trade the small and casual distribution must be gradually eliminated. It is felt that the production and distribution in large cities and towns may be entrusted to large well-managed corporations or organisations which can make use of every aid that science can offer and can improve the technical efficiency of their business and put on the market high quality products.

It is, therefore, recommended that State Government and Municipalities may examine the possibilities of establishing large up-to-date Central Slaughter-houses under their control in big cities like Bombay, Calcutta, Madras and Delhi to increase meat supplies to urban areas and its suburbs. Being desirable on economic grounds, as well as on the ground of public health, such larger units have undoubted advantages. In a slaughter-house of substantial size, it is possible to eliminate several wasteful operations and to ensure better planning and introduction of improved slaughtering techniques.

The quality of meat depends upon a number of factors which are both varied and complex and its determination requires a great deal of experience and skill: No progress has also been made with respect to the development of grade standards for dressed carcases, although this method is in general use in many foreign countries. The development and adoption of uniform grade standards are of utmost importance in the marketing of meats. In the absence of specified grade standards, buyers and sellers of meat are greatly handicapped. *It is recommended that efforts should, therefore, be made, in consultation with the meat trade, to determine and evolve suitable standards and grades under conditions that prevail in this country, as their development is likely to contribute to bringing about more efficient and more effective marketing.*

Co-operative marketing

Improvement of the meat industry can take place only by the betterment of social and economic condition of the butchers. At present many small butchers are not in a position to market their carcases advantageously when they market them individually. Co-operative buying and selling agencies seem to be the natural line of development and, if successful, should mean a reduction of marketing costs. The difficulties are formidable though not insuperable. *It is, therefore, recommended that local co-operative departments in consultation with the Directorate of Marketing and Inspection, should take steps to intensify co-operative activities among butchers to enable them to market their meat through co-operative sale societies.*

Transport and storage of meat

Almost all the means of transport used for carrying other agricultural products are employed for transporting meat from slaughter-houses to markets and meat stalls. Most of these being highly unsuitable for an easily perishable commodity like meat, a lot of damage takes place in transit. Therefore, the urgent need for quick and improved transport of meat cannot be over-emphasised.

It is recommended that regulations should be made requiring that vehicles used for meat transport should have such facilities for loading and unloading as would minimise a need for walking on the floor of the vehicle : that they should be capable of being easily and thoroughly cleansed ; that they should have impervious and non-slip floors.

Further Government and Municipal Authorities may provide, popularise and encourage the use of insulated or refrigerated motor meat-vans for transport of meat, wherever possible.

The necessity for refrigeration is nowhere stronger than in a tropical climate like India and particularly for an article of such short life as meat. The total loss caused in storage is computed roughly at Rs. 15 lakhs per year.

It is, therefore, recommended that State Governments and Municipalities may either provide suitable cold stores along with their meat markets or slaughter-houses or encourage private enterprise to do so at large important meat markets.

Reorganisation of meat marketing

The efficient marketing of meat and meat products is looked upon as a matter of national importance in other countries. In India, however, there is a general indifference and of no aspect of social economy are the people more ignorant than of the wholesomeness or otherwise of the flesh they consume. No great State can be built, if the health of the people is left endangered by food which can be better. At present the control in slaughter-houses is not in any degree effective and the one reason why there is a waste of glandular and other by-products is that as they belong to different parties there is no easy means of collection and no assurance of supply to justify establishment of the necessary manufacturing units. The assurance of supply will enable the immediate establishment of industries which by utilising what is now wasted would reduce the price of meat to consumers, apart from assuring the quality and possibly increasing the price of animals to producers.

The difficulties in the way of establishing the meat canning industry in India are many, but it is felt that a canning factory may with advantage be attached to the Central Slaughter-house envisaged in the plan for reorganisation of the meat industry. There is the added attraction of the possibility of canning typical Indian foods. In these days of labour shortage such products should become very popular as " cookie meals ".

Similarly factories may be installed to produce bone, meat and blood meals. The State Governments may impress upon the Municipal Boards and Notified Area and Town Area Committees under their jurisdiction to implement early a scheme for converting blood into blood-meal, in various slaughter-houses. The blood-meal is a valuable source of organic nitrogen for the crops. In order to make the enterprise attractive, Government may engage to buy a specified quantity of the product for Army and other Government Farms. Likewise processing of casings may be provided. The value of these will be enhanced if better methods of processing are followed.

To attain these desired ends, it is necessary that in a city or town the entire responsibility for production, processing and distribution of meat should be vested in a single duly authorised body. No meat should be allowed to be produced within the notified city or town by any other person. Retailing of meat should be through licensed retail butchers who should obtain whole supplies exclusively from the authority referred to. Unless Government moves boldly and according to a plan, the existing situation cannot be liquidated.

It is, therefore, recommended that the pilot meat plan for the reorganisation of the meat industry should be tried in the first instance at Bombay, Calcutta, Delhi, Madras, Lucknow, Bangalore, Hyderabad, Patna and Agra, as the results achieved at these places are likely to be of special value to other cities and towns. For operating the scheme at these experimental centres, the required capital may be found either by the local Government or the Municipality concerned or by both. The cost of the scheme which is of an educative nature, may also partly be borne by the Central Government. It is anticipated that the initial outlay will be covered by the accruing income from the lessees.

The importance and necessity of utilising and processing the glandular products cannot be over-emphasised. In many foreign countries great strides have been made in conserving and utilising these by-products. A large number of valuable glandular products used in medicines such as pepsin, pitutrin, adrenalin etc. are all obtained from animal glands. Taking into consideration the large number of animals that are slaughtered annually in this country, the scope for the development of these industries would appear to be very considerable in India.

It is recommended that the Council of Scientific and Industrial Research which is establishing various national laboratories in different parts of India may undertake along with Central Drugs Research Institute the systematic collection and processing of these glands and develop the manufacture and standardisation of various animal preparations like rennet, gelatine, meat essences etc., keeping an eye on the export market.

Statistics and research

Any policy with regard to improvement in meat industry presupposes accurate statistics relating to production and demand in India. The available statistics are quite unsatisfactory and unreliable and there is great necessity for improving them. In many foreign countries like United Kingdom, United States of America, etc. local authorities are required by regulation to cause records to be kept in a prescribed form relating to the inspection, seizure and disposal of condemned meat.

It is, therefore, recommended that provisions for the keeping of records should be applied by regulation in India and that the departments concerned should consider the form in which the records should be kept.

No research of any kind on meat, as far as it is known, is carried on anywhere in this country.

It is, therefore, recommended that Government of India may also sponsor and establish a Central Technological Research Institute at some suitable place like Bombay, Calcutta or Madras to conduct and carry out a comprehensive scientific research embracing all aspects of production, processing and utilisation of the meat industry.

Miscellaneous

At present fairly large quantities of meat and meat products of different kinds are imported into India and since it is known that there is no inspection made of the shipments at the port of entry, it is likely that some of the packers in foreign countries may not be conforming to certain food requirements.

It is, therefore, recommended that all foreign meat and meat products intended for sale in this country must be accompanied with proper veterinary inspection papers and an inspection by a competent authority should also be made of the shipment at the port of entry, and where necessary representative samples should be drawn and subjected to laboratory test. What does not conform to requirements should be refused entry or should be condemned or destroyed.

Prior to partition sheep casings were being exported to various foreign countries through the port of Karachi. After partition, however, the export of these articles from India to the United Kingdom and United States of America has come to a standstill in view of the fact that the veterinary health certificates now being issued by the local authorities in India are not acceptable to the importing countries under their regulations.

It is recommended that since there is an active demand for these articles in the United Kingdom, the Government of India may examine this question urgently with a view to facilitating the export of these articles to the United Kingdom and other foreign countries.

Marketing is not static ; it is highly dynamic. Consequently, it is to be expected that many profound changes will take place during the years that lie ahead. Butchers will need to appraise each new development with a view to making the adjustments required to take full advantage of new techniques. The meat marketing problem will continue to be one of determining ways and means by which meat can be marketed more effectively.

MEAT REPORT

APPENDICES

APPENDIX No. I.

Production of meat, in selected countries.
(1949).

(Thousand metric tons).

Continent and countries	Beef and Veal.	Pork	Mutton and lamb	Total (*a*)	Percentage to tota
Europe—					
Austria	55	80	2	137	0·4
Belgium	122	136	2	275	0·9
Czechoslovakia	104	184	1	306	1·0
Denmark	113	276	2	391	1·3
Finland	39	61	7	113	0·4
France (incl. Saar) ..	968	774	70	1,872	6·0
Germany Fed. Rep. and Soviet Zone (*b*).	569	866	81	1,578	5·0
Greece	(*c*) 13	(*c*) 19	(*c*) 53	(*c*) 85	0·3
Hungary	(*c*) 70	(*c*) 180	(*c*) 15	(*c*) 280	0·9
Iceland	2	..	7	10	Neg.
Ireland	58	68	14	156	0·5
Italy	266	197	48	578	1·9
Luxemburg	5	10	..	16	0·1
Netherlands	88	164	6	277	0·9
Norway	39	32	15	90	0·3
Poland	..	..	..	850	2·7
Spain	..	..	..	520	1·7
Sweden	111	164	3	294	1·0
Switzerland	73	79	3	173	0·6
United Kingdom	536	273	142	1,046	3·4
Yugoslavia	(*c*) 60	(*c*) 160	(*c*) 35	(*c*) 275	0·9

Source.—F. A. O Commodity Reports—Meat and Livestock 29 December, 1950.

(*a*) Total meat production figures, including allowance for edible offal.

(*b*) Includes fat cuts.

(*c*) 1948.

APPENDIX No. I—concld.

Continent and countries	Beef and Veal	Pork	Mutton and Lamb	Total (a)	Percentage to total
North & Central America—					
Canada	450	413	20	921	3·0
Cuba	140	30	1	182	0·6
Mexico	345	190	30	600	1·9
United States	4886,	4,687	275	10,527	33·9
South America—					
Argentina	2,034	202	217	2,618	8·4
Brazil	1,260	460	60	1,900	6·1
Chile	135	25	42	215	0·7
Colombia	268	29	2	320	1·0
Peru	63	40	53	165	0·5
Uruguay	289	14	81	410	1·3
Asia—					
India	(*d*) 172	24	(*e*) 273	(*f*) 469	1·5
Iran	52	..	100	162	0·5
Japan	45	38	..	88	0·3
Philippines	37	67	1	111	0·4
South Korea	(c) 15	(c) 6	(c) ..	(c) 22	0·7
Turkey	190	..	111	321	1·0
Africa—					
Algeria	17	12	32	65	0·2
Egypt	(*g*) 110	(*g*) 1	(*g*) 26	(*g*) 146	0·5
Ethiopia	215	..	96	332	1·1
Union of South Africa ..	330	53	80	530	1·7
Oceania—					
Australia	603	92	374	1,120	3·6
New Zealand	180	40	325	565	1·8
Total ..	15,127	10,146	2,705	31,111	100·0

(*d*) Beef and buffalo flesh.

(*e*) Mutton and goat flesh.

(*f*) Excluding edible offals. 469 Met. Tons=461.

(*g*) 1948-49.

APPENDIX No. II

International trade in meat (1949)

[Thousand metric tons]

Continent and countries	Imports	Exports
Europe—		
Austria	15	..
Belgium-Luxembourg	41	10
Bulgaria	..	..
Czechoslovakia	27	..
Denmark	..	155
Finland	..	6
France	15	23
Germany : Fed. Rep	62	..
Greece	17	..
Hungary	..	1
Iceland	..	..
Ireland	..	16
Italy	22	8
Netherlands	40	38
Norway	4	..
Poland	..	20
Portugal	1	1
Romania	..	..
Spain	8	..
Sweden	17	1
Switzerland	10	1
United Kingdom	1,210	4
Yugoslavia	..	..

APPENDIX No. II—*concld.*

Continent and countries	Imports	Exports
North America—		
Canada	15	96
Cuba	11	..
United States (*a*)	113	62
Mexico	..	60
South America—		
Argentina	..	600
Brazil	..	40
Chile	..	1
Paraguay	..	14
Peru	16	..
Uruguay	..	108
Asia—		
Japan	1	..
Philippines	11	..
Africa—		
Algeria	3	3
Egypt	1	..
Madagascar	..	16
Southern Rhodesia	1	3
Union of South Africa	9	2
Oceania—		
Australia	..	250
New Zealand (*b*)	..	357

(*a*) Includes shipments to non-contiguous territories and shipments for military and civilian feeding.

(*b*) Twelve months ending September of year stated.

Source.—F. A. O. Commodity Reports—Meat and livestock, Dec. 1950

APPENDIX No. III.

Production of beef in India (1949).

State	No. of animals slaughtered.	Average yield per animal (lb.)					Production (tons)				
		Meat with bones and fat.**	Fat†	Head & legs.	Edible offals.‡	Total	Meat with bones and fat**	Fat†	Head & legs.	Edible offals.‡	Total yield
Assam	29,281	140·0	4·0	18·0	18·0	180·0	1830·1	52·3	235·3	235·3	2,353·0
Bihar	235,365	130·0	3·5	20·0	20·0	173·5	13659·6	367·7	2101·5	2101·5	18,220·3
Bombay	165,000	225·0	10·0	28·0	28·0	291·0	16573·7	736·6	2062·5	2062·5	21,[illegible]35·3
Delhi	..	..	..	..	..	..	..	..	..	..	..
Himachal Pradesh	..	..	..	..	..	..	..	..	..	..	..
Hyderabad	87,852	140·0	5·0	22·0	22·0	189·0	5,490·8	196·1	862·8	862·8	7412·5
Kashmir	..	..	..	..	..	..	..	..	..	..	..
Madhya Bharat	..	..	..	..	..	..	..	..	..	..	..
Madhya Pradesh	44,025	140·0	4·0	20·0	20·0	184·0	2,751·6	78·6	393·1	393·1	3,616·4
Madras	407,000	180·0	6·0	25·0	25·0	236·0	32,705·4	1,090·2	4,542·4	4,542·4	42,880·4
Mysore	..	..	..	..	..	..	..	..	..	..	..
Orissa	32,777	120·0	4·0	18·0	18·0	160·0	1,755·9	58·5	263·4	263·4	2,341·2
PEPSU	..	..	..	..	..	..	..	..	..	..	..
Punjab (I)	..	..	..	..	..	..	..	..	..	..	..
Rajasthan	5,475	140·0	4·0	24·0	24·0	192·0	342·2	9·7	58·7	58·7	469·3
Saurashtra	..	..	..	..	..	..	..	..	..	..	..
Travancore-Cochin	12,504	150·0	3·0	20·0	20·0	193·0	837·4	16·7	111·6	111·6	1,677·3
Uttar Pradesh	56,585	160·0	6·0	20·0	20·0	206·0	4,041·8	151·6	505·2	505·2	5,203·8
Vindhya Pradesh	..	..	..	..	..	..	..	..	..	..	..
West Bengal	180,085	184·5	4·0	20·0	20·0	228·5	14,832·9	321·6	1,607·9	1,607·9	18,370·3
Others*	13,180	174·3	3·9	19·9	19·9	218·0	1,025·6	23·5	116·8	116·8	1,[illegible]12·7
Total ..	1,269,129	169·2	5·5	22·7	22·7	220·1	95,847·0	3,103·1	12,861·2	12,861·2	1,24,672·5

* Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura States.

** Meat with bones and fat as it is sold by retailers to consumers.

† Fat sold as such and not with meat.

‡ Edible offals include liver, spleen, lungs, kidneys, testicles, brain etc.

APPENDIX No. IV.

Production of buffalo-flesh in India (1949).

State	No. of animals slaughtered.	Average yield per animal (lb.)					Production (tons)				
		Meat with bones and fat**	Fat†	Head & legs.	Edible offals‡	Total	Meat with bones and fat**	Fat†	Head & legs.	Edible offals‡	Total
Assam	3,000	285·0	8·0	25·0	25·0	343·0	381·7	10·7	33·5	33·5	459·4
Bihar	50,380	175·0	5·0	25·0	25·0	230·0	3,935·9	112·4	562·3	562·3	5,172·9
Bombay	54,690	450·0	20·0	38·0	38·0	546·0	10,986·8	488·3	927·8	927·8	13,330·7
Delhi	..	..	..	..	..	..	..	..	..	..	..
Himachal Pradesh ..	..	..	..	..	..	..	..	..	..	..	..
Hyderabad	11,885	275·0	8·0	25·0	25·0	333·0	1,459·1	42·5	132·6	132·6	1,766·8
Kashmir	..	..	..	..	..	..	..	..	..	..	..
Madhya Bharat	..	..	..	..	..	..	..	..	..	..	..
Madhya Pradesh	7,350	275·0	8·0	25·0	25·0	333·0	902·4	26·2	82·0	82·0	1,092·6
Madras	123,000	300·0	12·0	27·0	27·0	366·0	16,473·2	658·9	1,482·6	1,482·6	20,097·3
Mysore	..	..	..	..	..	..	..	..	..	..	..
Orissa	1,126	175·0	10·0	22·0	22·0	229·0	87·9	5·0	11·1	11·1	115·1
PEPSU	..	..	..	..	..	..	..	..	..	..	..
Punjab (I)	..	..	..	..	..	..	..	..	..	..	..
Rajasthan..	365	384·0	12·0	30·0	30·0	456·0	62·6	1·9	4·9	4·9	74·3
Saurashtra	..	..	..	..	..	..	..	..	..	..	..
Travancore-Cochin	3,088	200·0	5·0	25·0	25·0	255·0	275·7	6·9	34·5	34·5	351·6
Uttar Pradesh	278,042	280·0	8·0	30·0	30·0	348·0	34,755·3	993·0	3,723·8	3,723·8	43,195·9
Vindhya Pradesh	..	..	..	..	..	..	..	..	..	..	..
West Bengal	23,462	365·0	8·0	30·0	30·0	433·0	3,823·1	83·8	314·2	314·2	4,535·3
Others*	7,631	244·5	6·5	25·5	25·5	302·0	833·0	22·2	86·9	86·9	1,029·0
Total ..	564,019	293·8	9·7	29·4	29·4	362·3	73,976·7	2,451·8	7,396·2	7,396·2	91,220·9

* Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura States.

** Meat with bones and fat as it is sold by retailers to consumers.

† Fat sold as such and not with meat.

‡ Edible offals include liver Spleen, lungs, kidneys, testicles, brain, etc.

APPENDIX No. V.

Production of mutton in India (1949).

State	No. of animals slaughtered	Average yield per animal (lb).					Production (tons)				
		Meat with bones and fat**	Fat†	Head and legs	Edible offals‡	Total	Meat with bones and fat**	Fat†	Head and legs	Edible offals‡	Total
Assam	1,892	18·0	2·0	3·0	3·0	26·0	15·2	1·7	2·5	2·5	21·9
Bihar	268,744	17·5	1·0	3·5	3·5	25·5	2,099·6	120·0	419·9	419·9	3,059·4
Bombay	1,819,639	22·0	2·0	4·0	4·0	32·0	17,865·6	1,624·1	3,248·3	3,248·3	25,986·3
Delhi	201,520	22·0	2·0	4·0	4·0	32·0	1,979·2	179·9	359·9	359·9	2,878·9
Himachal Pradesh	58,700	22·0	2·0	4·0	4·0	32·0	576·5	52·4	104·8	104·8	838·5
Hyderabad	287,977	21·0	0·5	4·0	4·0	29·5	2,699·8	64·3	514·2	514·2	3,792·5
Kashmir	261,008	22·0	0·5	4·0	4·0	30·5	2,563·5	58·2	466·1	466·1	3,553·9
Madhya Bharat	84,829	20·0	1·0	3·0	3·0	27·0	757·4	37·9	113·6	113·6	1,022·5
Madhya Pradesh	130,670	20·0	1·0	3·0	3·0	27·0	1,166·7	58·3	175·0	175·0	1,575·0
Madras	4,845,000	20·0	1·0	4·0	4·0	29·0	43,258·9	2,162·9	8,651·8	8,651·8	62,725·4
Mysore	1,073,500	19·5	0·5	4·0	4·0	28·0	9,345·2	239·6	1,917·0	1,917·0	13,418·8
Orissa	111,079	16·5	0·5	3·0	3·0	23·0	818·2	24·8	148·8	148·8	1,140·6
PEPSU	53,766	21·0	2·0	3·5	3·5	30·0	504·1	48·0	72·0	72·0	696·1
Punjab (I)	156,497	20·0	1·0	3·5	3·5	28·0	1,397·3	69·9	244·5	244·5	1,956·2
Rajasthan	1,183,802	18·0	1·0	4·0	4·0	27·0	9,512·7	528·5	2,113·9	2,113·9	14,269·0
Saurashtra	301,372	18·0	1·0	4·0	4·0	27·0	2,421·7	134·5	538·2	538·2	3,632·6
Travancore-Cochin	157,497	20·0	1·0	4·0	4·0	29·0	1,406·3	70·3	281·2	281·2	2,039·0
Uttar Pradesh	1,250,349	18·0	1·0	4·0	4·0	27·0	10,047·4	558·2	2,232·8	2,232·8	15,071·2
Vindhya Pradesh	73,726	18·0	1·0	3·5	3·5	26·0	592·4	32·9	115·2	115·2	855·7
West Bengal	225,941	20·0	1·0	3·0	3·0	27·0	2,017·3	100·9	302·6	302·6	2,723·4
Others*	134,929	18·3	1·1	3·5	3·5	26·4	1,105·0	65·4	210·5	210·5	1,591·4
Total ..	12,681,837	19·8	1·1	3·9	3·9	28·7	112,150·0	6,232·7	22,232·8	22,232·8	162,848·3

*Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur Sikkim and Tripura States.

** Meat with bones and fat as it is sold by retailers to consumers.

†Fat sold as such and not with meat.

‡Edible offals include liver, spleen, lungs kidneys, testicles, brain etc.

APPENDIX No. VI.

Production of goat flesh in India (1949).

State	No. of animals slaughtered	Average yield per animal (lb.)					Production (tons)				
		Meat with bones and fat**	Fat†	Head and legs	Edible offals‡	Total	Meat with bones and fat**	Fat†	Head and legs	Edible offals‡	Total
Assam	118,806	16·0	0·5	3·0	3·0	22·5	848·6	26·5	159·1	159·1	1,193·3
Bihar	1,533,583	17·0	1·0	3·5	3·5	25·0	11,638·8	684·6	2,396·2	2,396·2	17,115·8
Bombay	2,491,057	22·0	1·0	3·5	3·5	30·0	24,465·8	1,112·1	3,892·2	3,892·2	33,362·3
Delhi	396,081	20·5	0·5	3·5	3·5	28·0	3,624·8	88·4	618·9	618·9	4,951·0
Himachal Pradesh	55,300	22·0	1·0	3·0	3·0	29·0	543·1	24·7	74·1	74·1	716·0
Hyderabad	759,053	23·0	0·5	4·5	4·5	32·5	7,793·8	169·4	1,524·9	1,524·9	11,013·0
Kashmir	286,893	25·0	0·5	4·0	4·0	33·5	3,201·9	64·1	512·3	512·3	4,290·6
Madhya Bharat	469,296	22·0	1·0	4·0	4·0	31·0	4,609·	209·5	838·0	838·0	6,494·7
Madhya Pradesh	840,140	22·0	1·0	4·0	4·0	31·0	8,251·4	375·1	1,500·2	1,500·2	11,626·9
Madras	2,475,000	20·0	1·0	4·5	4·5	30·0	22,098·2	1,104·9	4,972·1	4,972·1	33,147·3
Mysore	626,500	21·0	0·5	4·0	4·0	29·5	5,873·4	139·9	1,118·7	1,118·7	8,250·7
Orissa	184,440	16·5	0·5	3·0	3·0	23·0	1,358·6	41·2	247·0	247·0	1,893·8
PEPSU	157,531	21·0	1·0	3·0	3·0	28·0	1,476·9	70·3	211·0	211·0	1,969·2
Punjab (I)	635,028	18·0	0·5	3·5	3·5	25·5	5,102·9	141·8	992·2	992·2	7,229·1
Rajasthan	1,457,394	20·0	0·5	3·0	3·0	26·5	13,012·4	325·3	1,951·9	1,951·9	17,241·5
Saurashtra	207,903	20·0	0·5	3·0	3·0	26·5	1,856·3	46·4	278·4	278·4	2,459·5
Travancore-Cochin ..	131,406	22·0	1·0	3·5	3·5	30·0	1,290·6	58·7	205·3	205·3	1,759·9
Uttar Pradesh	2,864,152	18·0	1·0	4·0	4·0	27·0	23,015·5	1,278·6	5,114·6	5,114·6	34,523·3
Vindhya Pradesh	225,250	20·0	0·5	3·0	3·0	26·5	2,011·2	50·2	301·7	301·7	2,664·8
West Bengal	1,413,290	18·5	0·5	3·0	3·0	25·0	11,672·2	315·5	1,892·8	1,892·9	15,773·3
Others*	216,699	19·6	0·6	3·6	3·6	27·4	1,892·7	61·6	347·8	347·8	2,649·9
Total ..	17,544,802	19·9	0·8	3·7	3·7	28·1	155,638·3	6,388·8	29,149·4	29,149·4	2,20,325·9

* Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura States.

** Meat with bones and fat as it is sold by retailers to consumers.

† Fat sold as such and not with meat.

‡ Edible offals include liver, spleen, lungs, kidneys, testicles, brain etc.

APPENDIX No. VII.

Production of pork in India (1949).

State	No. of animals slaughtered	Average yield per animal (lb.)					Production (tons)				
		Meat with bones and fat**	Fat	Head and legs	Edible offals‡	Total	Meat with bones and fat**	Fat†	Head and legs	Edible offals‡	Total
Assam	53,988	60·0	6·0	10·0	10·0	86·0	1,446·1	144·6	241·0	241·0	2,072·7
Bihar	44,000	50·0	6·0	8·0	8·0	72·0	982·1	117·9	157·1	157·1	1,414·2
Bombay	21,306	50·0	6·0	10·0	10·0	76·0	475·6	57·1	95·1	95·1	722·9
Delhi	2,240	75·0	6·0	10·0	10·0	101·0	75·0	6·0	10·0	10·0	101·0
Himachal Pradesh	30,281	80·0	8·0	10·0	10·0	108·0	1,081·5	108·1	135·2	135·2	1,460·0
Hyderabad	112,000	60·0	4·0	10·0	10·0	84·0	3,000·0	200·0	500·0	500·0	4,200·0
Kashmir	..	..	..	..	..	..	..	..	..	..	..
Madhya Bharat	..	..	..	..	..	..	..	..	..	..	..
Madhya Pradesh	53,562	60·0	4·0	10·0	10·0	84·0	1,434·7	95·7	239·1	239·1	2,008·6
Madras	370,000	60·0	10·0	10·0	8·0	88·0	9,910·7	1,651·8	1,651·8	1,321·4	14,[illegible]·7
Mysore	16,726	75·0	5·0	10·0	10·0	100·0	359·1	23·9	47·9	47·9	478·8
Orissa	1,617	75·0	5·0	10·0	10·0	100·0	54·1	3·6	7·2	7·2	72·1
PEPSU	..	..	..	..	..	..	..	..	..	..	..
Punjab (I)	10,963	100·0	10·0	15·0	10.0	135·0	489·4	48·9	73·5	48·9	660·7
Rajasthan	..	..	..	..	..	..	..	..	..	..	..
Sauarshtra	..	..	..	..	..	..	..	..	..	..	..
Travancore-Cochin	400	80·0	10·0	10·0	10·0	110·0	14·3	1·8	1·8	1·8	19·7
Uttar Pradesh	31,426	80·0	10·0	15·0	10·0	115·0	1,122·4	140·3	210·4	140·3	1,613·3
Vindhya Pradesh	..	..	..	..	..	..	..	..	..	..	..
West Bengal	63,046	100·0	10·0	9·0	8·0	127·0	2,814·6	281·5	253·3	225·1	3,574·5
Others*	11,240	74·5	6·0	10·0	8·6	99·1	373·6	30·2	50·3	43·1	497·2
Total ..	816,795	64·8	8·0	10·1	8·8	91·7	23,633·2	2,911·4	3,673·7	3,213·2	33,431·5

* Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura States.

** Meat with bones and fat as it is sold by retailers to consumers.

† Fat sold as such and not with meat.

‡ Edible offals include liver, spleen, lungs, kindneys, testscles brain etc

APPENDIX No. VIII.

Number of animals slaughtered inside and outside slaughter-houses India (1949).

State	Cattle			Buffaloes			Sheep			Goats			Pigs		
	Inside slaughter house	Outside slaughter house	Total	Inside slaughter house	Outside slaughter house	Total	Outside slaughter house	Outside slaughter house	Total	Inside slaughter house	Outside slaughter house	Total	Inside slaughter house	Outside slaughter house	Total
Assam ..	..	29,281	29,281	..	3,000	3,000	1,892	..	1,892	29,702	89,104	118,806	..	53,988	53,988
Bihar ..	45,649	189,716	235,365	13,348	37,032	50,380	28,433	240,311	268,744	305,673	1,227,910	1,533,583	..	44,000	44,000
Bombay ..	115,702	49,298	165,000	47,055	7,635	54,690	1,042,965	776,074	1,819,039	957,880	1,533,177	2,491,057	21,306	..	21,306
Delhi ..	..	..	..	..	..	..	191,444	10,076	201,520	376,277	19,804	396,081	389	1,851	2,240
Himachal Pradesh.	..	..	..	..	..	..	2,935	55,765	58,700	5,807	49,493	55,300	..	30,291	30,281
Hyderabad..	66,140	21,712	87,852	7,340	4,545	11,885	186,658	101,319	287,977	655,361	103,692	759,053	..	112,000	112,000
Kashmir ..	..	..	..	..	..	..	86,209	174,799	261,008	67,482	219,411	286,893	..	..	..
Madhya Bharat.	..	..	..	..	..	..	67,863	16,966	84,829	351,972	117,324	469,296	..	..	..
Madhya Pradesh.	42,605	1,420	44,025	7,050	300	7,350	65,670	65,000	130,670	230,240	609,900	840,140	562	53,000	53,562
Madras ..	89,929	317,071	407,000	22,772	100,228	123,000	1,520,000	3,325,000	4,845,000	1,051,000	1,424,000	2,475,000	12,194	357,806	370,000
Mysore ..	..	..	..	..	..	..	373,500	700,000	1,073,500	226,500	400,000	626,500	2,489	8,237	10,726
Orissa ..	..	32,777	32,777	..	1,126	1,126	31,214	79,865	111,079	52,851	131,589	184,440	..	1,617	1,617
P.E.P.S.U. ..	..	..	..	..	..	..	48,873	4,893	53,766	151,387	6,144	157,531	..	..	..
Punjab (I) ..	..	..	..	..	..	..	93,458	63,039	156,497	254,433	380,595	635,028	2,032	8,931	10,963
Rajasthan ..	5,475	..	5,475	365	..	365	947,042	236,760	1,183,802	1,093,045	364,349	1,457,394	..	..	..
Saurashtra ..	..	..	..	..	..	..	241,098	60,274	301,372	166,323	41,580	207,903	..	..	..
Travancore-Cochin.	3,552	8,952	12,504	1,212	1,876	3,088	90,876	66,621	157,497	76,610	54,796	131,406	..	400	400
Uttar Pradesh	56,585	..	56,585	202,196	75,846	278,042	1,000,279	250,070	1,250,349	2,148,114	716,038	2,864,152	803	30,623	31,426
Vindhya Pradesh.	..	..	..	..	..	..	58,981	14,745	73,726	168,937	56,313	225,250	..	..	..
West Bengal	111,131	68,954	180,085	22,527	935	23,462	128,334	97,607	225,941	388,648	1,024,642	1,413,290	17,876	45,170	63,046
Others (*a*) ..	..	13,180	13,180	3,381	4,250	7,631	79,682	55,247	134,929	143,527	73,172	216,699	65	11,175	11,240
Total ..	536,768	732,361	1,269,129	327,246	236,773	564,019	6,287,406	6,394,431	12,681,837	8,901,769	8,643,033	17,544,802	57,716	759,079	816,795

(*a*) Includes Ajmer, Bhopal, Bilaspur, Coorg, Kutch, Manipur, Sikkim and Tripura States.

APPENDIX No. IX.

Quantity of (different kinds of meat) supplied to ships.

(In lb.).

Year	Bombay			Calcutta			Madras			
	Beef	Mutton	Pork	Beef	Mutton	Pork	Beef	Mutton	Pork	Bacon & Ham
1945	345,657	347,574	60,820	519,781	162,006	50,384	281,678	127,250	47,294	3,211
1946	217,222	269,149	22,651	618,891	213,131	87,369	113,567	98,206	27,149	241
1947	264,635	273,966	33,395	453,807	140,560	55,813	146,778	60,903	17,282	1,069
1948	2,924	50,147	N.A.	134,530	42,688	17,203	91,211	39,529	3,533	652
1949	1,695	32,515	N.A.	525,620	175,165	43,919	74,706	23,550	2,036	149
Average ..	166,427	194,670	38,955	450,526	146,710	50,938	141,588	69,888	19,458	1,065

N.A.—Not available.

N.B.—Bombay figures for 1948 and 1949 are from two Companies only.

APPENDIX X

APPENDIX

Food values of different

Name of Foodstuff	Moisture per cent	Protein per cent	Fat (Ether extractives) per cent	Mineral matter per cent	Fibre per cent	Carbohydrate per cent	Calcium (ca) per cent
Milk, Cow's	87·6	3·3	3·6	0·7	..	4·8	0·12
Milk, buffalo's	81·0	4·3	8·8	0·8	..	5·1	0·21
Milk, goats'	85·2	3·7	5·6	0·8	..	4·7	0.17
Milk, human	88·0	1·0	3·9	0·1	..	7·0	0·02
Curds	90·3	2·9	2·9	0·6	..	3·3	0·12
Butter-milk	97·5	0·8	1·1	0·1	..	0·5	0·03
Skimmed-milk	92·1	2·5	0·1	0·7	..	4·6	0·12
Cheese	40·3	24·1	25·1	4·2	..	6·3	0·79
'Koa' (whole buffalo milk).	30·6	14·6	31·2	3·1	..	20·5	0·65
'Koa' (skimmed buffalo milk).	46·1	22·3	1·6	4·3	..	25·7	0·99
Beef (muscle)	74·3	22·6	2·6	1·0	..	..	0·01
Egg, duck	71·0	13·5	13·7	1·0	..	0·7	0·07
Egg, fowl	73·7	13·3	13·3	1·0	..	..	0·06
Fish (Mangalore, big fish)	78·4	22·6	0·6	0·8	..	..	0·02
Liver, Sheep	70·4	19·3	7·5	1·5	..	1·4	0·01
Mutton (muscle)	71·5	18·5	13·3	1·3	..	..	0·15
Pork (muscle)	77·4	18·7	4·4	1·0	..	..	0·03
Rice, raw, milled	14·4	6·7	0·7	0·8	..	77·4	0·01
Wheat flour, whole (*atta*)	12·2	12·1	1·7	1·8	..	72·2	0·04
Bengal gram (with outer husk).	9·8	17·1	5·3	2·7	3·9	61·2	0·19
Cabbage	90·2	1·8	0·1	0·6	1·0	6·3	0·03
Spinach	91·7	1·9	0·9	1·5	..	4·0	0·06
Carrot	86·0	0·9	0·1	1·1	1·2	10·7	0·08
Onion, big	86·8	1·2	(*a*)	0·4	..	11·6	0·18
Potato	74·7	1·6	0·1	0·6	..	22·9	(*b*)
Sweet Potato	66·5	1·2	0·3	1·0	..	31·0	0·02
Tapioca	59·4	0·7	0·2	1·0	..	38·7	0·05
Cauliflower	89·4	3·5	0·4	1·4	..	5·3	0·03
Ladies fingers	88·0	2·2	0·2	0·7	1·2	7·7	0·09
Peas, English	72·1	7·2	0·1	0·8	..	19·8	0·02
Groundnut, roasted	4·0	31·5	39·8	2·3	3·1	19·3	0·05
Apple	85·9	0·3	0·1	0·3	..	13·4	(*b*)
Banana	61·4	1·3	0·2	0·7	..	36·4	(*b*)
Grape fruit (Marslis seedless).	88·5	1·0	0·1	0·4	..	10·0	0·03
Guava, Country	6·1	1·5	0·2	0·8	6·9	14·5	0·01
Mango, ripe	86·1	0·6	0·1	0·3	1·1	11·8	0·01
Orange	87·8	0·9	0·3	0·4	..	10·6	0·05
Tomato, ripe	94·5	1·0	0·1	0·5	..	3·9	0·01

Source :—Table No. 27, Live-stock statistics, issued by the Director of Economics and

* Whole grains are rich in vitamin B, while milled

An exception is for boiled rice, which retains a large

(*a*) Less

(*b*) Less

No. X.

food stuffs.

Phosphorus (P) per cent	Iron (Fe) Mgs. per cent	Calorific value per 100 ms.	Vitamin A (International units per 100 gms.)	Carotene (International vitamin A units per 100 gms.	Vitamin B,* (International units per 100 gms.)	Vitamin C mgs. per 100 gms.	Calories per Ounce.
0·09	0·2	65	180	Trace	17	2	18
0·13	0·2	117	162	Trace	..	..	33
0·12	0·3	84	182	Trace	..	..	24
0·01	0·2	67	208	Trace	..	..	19
0·09	0·3	51	130	Trace	..	..	14
0·03	0·8	15	Trace	0	..	..	4
0·09	0·2	29	..	..	..	1	8
0·52	2·1	348	273	..	..	..	99
0·42	5·8	21	..	..	..	0	120
0·65	2·7	206	..	..	..	0	59
0·19	0·8	114	59	Trace	50	2	32
0·26	3·0	180	1,200	900	..	..	51
0·22	2·1	173	1,200	1,000	..	..	49
0·19	0·9	91	26	9·0	..	..	26
0·38	6·3	150	22,300	0	120	20	43
0·15	2·5	194	31	Trace	60	..	55
0·20	2·3	114	Trace	Trace	180	2	32
0·16	1·9	343	..	..	39	..	97
0·32	7·3	353	..	..	..	..	100
0·24	9·8	361	..	316	100	..	103
0·05	0·8	33	..	2,000	50	124	9
0·01	5·0	32	..	2,600 to 3,500	70	48	9
0·03	1·5	47	..	2,000 to 4,300	60	3	13
0·05	0·7	51	..	..	40	11	14
0·03	0·7	99	..	40	20	17	28
0·05	0·8	132	..	10	..	24	37
0·04	0·9	159	..	..	15	..	45
0·06	1·3	39	..	38	110	66	11
0·08	1·5	41	..	58	21	16	12
0·08	1·5	109	..	139	120	9	31
0·44	0·3	561	..	.	..	0	159
0·02	1·7	56	..	Trace	40	2	16
0·05	0·4	153	..	Trace	5	1	43
0·03	0·2	45	..	..	40	..	13
0·04	1·0	66	..	Trace	..	299	19
0·02	0·3	50	..	4,800	..	13	14
0·02	0·1	49	..	350	40	68	14
0·02	0·1	21	..	320	40	32	6

Statistics, Ministry of Agriculture, Government of India (D.E.S. 4) January 1950.
grains are largely deprived of this Vitamin.
part of vitamin B I after milling.
than 0·1.
than 0·01

APPENDIX

Trend of prices of different types

Per

(In

Year	Beef							
	Nagpur	Calcutta	Delhi	Madras	Bangalore	Bombay	Average	Index No.
1938	0 2 8	0 2 6	0 2 0	0 3 0	0 2 0	0 3 9	0 2 8	100
1939	0 2 8	0 2 6	0 2 0	0 3 0	0 4 0	0 3 9	0 3 0	112
1940	0 2 9	0 3 0	0 2 6	0 3 6	0 5 0	0 4 0	0 3 6	131
1941	0 2 9	0 3 3	0 3 0	0 4 0	0 5 0	0 4 6	0 3 9	141
1942	0 3 0	0 4 6	0 3 9	0 4 6	0 6 0	0 5 0	0 4 6	169
1943	0 3 3	0 5 6	0 4 9	0 6 0	0 6 0	0 5 9	0 5 3	197
1944	0 5 6	0 8 6	0 5 9	0 8 0	0 8 0	0 8 0	0 7 3	272
1945	0 6 0	0 9 0	0 6 0	0 8 0	0 8 0	0 9 6	0 7 9	291
1946	0 6 0	0 9 6	0 6 9	0 8 6	0 10 0	0 9 6	0 8 3	308
1947	0 6 9	0 10 0	0 8 0	0 9 0	0 10 0	0 10 0	0 9 0	337
1948	0 7 9	0 9 0	..	0 8 6	0 9 0	0 11 0	0 9 0	337
1949	0 7 9	0 10 9	..	0 8 6	0 10 0	0 10 9	0 9 6	356
1950	0 7 9	0 11 9	..	0 8 0	0 10 0	0 12 0	0 10 0	375

Year	Baffalo flesh							
	Nagpur	Calcutta	Delhi	Madras	Banglore	Bombay	Average	Index No.
1938	0 2 8	0 2 6	0 2 0	0 3 0	0 2 0	0 2 9	0 2 6	100
1939	0 2 7	0 2 6	0 2 0	0 3 0	0 4 0	0 2 9	0 2 9	110
1940	0 2 4	0 2 6	0 2 6	0 3 6	0 5 0	0 3 6	0 3 3	130
1941	0 2 4	0 2 3	0 2 6	0 3 6	0 5 0	0 3 6	0 3 6	140
1942	0 2 4	0 3 5	0 2 9	0 4 6	0 5 0	0 4 0	0 4 0	160
1943	0 3 3	0 4 3	0 3 9	0 5 0	0 8 0	0 4 6	0 4 9	190
1944	0 5 6	0 8 6	0 4 0	0 8 0	0 8 0	0 7 0	0 7 0	280
1945	0 6 0	0 9 0	0 6 0	0 8 0	0 8 0	0 7 9	0 7 6	300
1946	0 6 0	0 9 6	0 6 9	0 8 6	0 10 0	0 7 9	0 8 0	320
1947	0 6 9	0 10 0	0 8 0	0 9 0	0 10 0	0 9 0	0 8 9	330
1948	0 7 9	0 9 0	..	0 8 0	0 9 0	0 9 6	0 8 9	330
1949	0 7 9	0 10 9	..	0 8 0	0 10 0	0 10 0	0 9 3	370
1950	0 7 9	0 11 0	..	0 8 0	0 10 0	0 11 0	0 9 6	380

No. XI.

of meat in certain markets

lb.).

rupees).

Year	Mutton							
	Nagpur	Calcutta	Delhi	Madras	Bangalore	Bombay	Average	Index No.
1938	0 4 6	0 4 6	0 5 0	0 5 0	0 5 6	0 5 6	0 5 0	100
1939	0 4 6	0 4 9	0 5 9	0 5 0	0 6 0	0 5 6	0 5 3	105
1940	0 5 0	0 5 6	0 6 0	0 6 0	0 7 0	0 6 0	0 5 9	115
1941	0 5 6	0 6 3	0 6 9	0 6 0	0 7 0	0 7 0	0 6 6	130
1942	0 6 0	0 8 0	0 7 0	0 8 0	0 8 0	0 8 6	0 7 6	150
1943	0 6 6	0 10 6	0 8 3	0 10 0	0 10 0	0 10 0	0 9 3	185
1944	0 8 0	0 12 0	0 8 6	0 12 0	0 12 0	0 12 0	0 10 9	215
1945	0 10 0	0 14 0	0 9 6	0 12 0	0 14 0	1 0 0	0 12 6	250
1946	0 10 0	1 2 0	0 9 6	0 13 6	0 14 0	1 1 0	0 13 9	275
1947	0 12 0	1 3 0	0 12 0	1 2 3	1 1 0	1 2 9	1 0 3	325
1948	0 15 0	1 6 6	0 12 0	1 4 0	1 1 0	1 3 0	1 1 6	350
1949	0 15 0	1 5 9	0 12 0	1 3 9	1 1 0	1 3 0	1 1 6	350
1950	0 15 0	1 6 6	0 14 0	1 4 0	1 1 0	1 3 0	1 2 0	360

Year	Goat flesh							
	Nagpur	Calcutta	Delhi	Madras	Bangalore	Bombay	Average	Index No.
1938	0 4 6	0 4 6	0 3 3	0 5 0	0 5 6	0 5 6	0 4 9	100
1939	0 4 6	0 4 9	0 3 9	0 5 0	0 6 0	0 5 6	0 5 0	105
1940	0 5 0	0 5 6	0 4 9	0 6 0	0 7 0	0 6 0	0 5 9	121
1941	0 5 6	0 6 6	0 5 6	0 6 0	0 7 0	0 7 0	0 6 3	131
1942	0 6 0	0 8 0	0 6 0	0 8 0	0 8 0	0 8 6	0 7 6	158
1943	0 6 6	0 10 0	0 7 0	0 10 0	0 10 0	0 10 0	0 9 0	190
1944	0 8 0	0 12 0	0 8 6	0 12 0	0 12 0	0 12 0	0 10 9	226
1945	0 10 0	0 14 0	0 10 6	0 12 0	0 14 0	1 0 0	0 12 9	268
1946	0 10 9	1 2 3	0 11 3	0 13 6	0 14 0	1 1 0	0 14 0	295
1947	0 13 0	1 1 3	0 12 3	1 2 3	1 1 0	1 2 9	1 0 0	337
1948	1 0 0	1 4 0	0 12 0	1 4 0	1 1 0	1 3 0	1 1 3	363
1949	0 15 0	1 3 9	0 12 0	1 3 9	1 1 0	1 3 0	1 1 0	358
1950	0 15 0	1 4 3	0 14 0	1 4 0	1 1 0	1 3 0	1 1 6	368

APPENDIX No. XI—*contd.*

Year	Pork						
	Nagpur	Calcutta	Madras	Bangalore	Bombay	Average	Index No.
1938	0 4 0	0 4 6	0 5 0	0 5 0	0 10 0	0 5 9	100
1939	0 4 0	0 4 6	0 5 0	0 5 0	0 10 0	0 5 9	100
1940	0 4 0	0 5 6	0 6 0	0 6 0	0 10 0	0 6 3	109
1941	0 5 0	0 6 6	0 7 0	0 6 0	0 11 0	0 7 0	122
1942	0 5 9	0 7 6	0 8 6	0 7 6	0 12 0	0 8 3	143
1943	0 6 9	0 8 6	0 9 6	0 8 0	0 14 0	0 9 6	165
1944	0 8 3	0 9 0	0 11 0	0 10 0	1 0 0	0 10 9	167
1945	0 10 0	0 10 0	0 12 0	0 12 0	1 3 0	0 12 6	217
1946	0 10 0	0 11 0	0 14 0	0 12 0	1 3 0	0 13 3	230
1947	0 12 0	0 12 0	0 14 0	0 13 0	1 2 9	0 14 0	243
1948	0 12 0	0 14 0	0 15 9	0 13 0	1 3 9	0 14 9	256
1949	0 13 9	0 12 3	1 0 0	0 15 0	1 3 9	0 15 6	270
1950	0 13 6	0 13 0	1 0 0	0 15 0	1 3 0	0 15 6	270

APPENDIX No. XII.

Prices of offals at some important markets for pre-inter and post-war periods.

Market	Period	Cattle						
		Brain	Tongus	Lungs	Heart	Liver	Kidney	Spleen
Hyderabad	Pre-war	0 0 7	0 4 3	0 0 8	0 2 2		0 0 8	0 0 10
	War ..	0 1 8	0 5 2	0 1 5	0 5 2		0 1 3	0 1 3
	Post-war 1949-50	0 3 5	0 12 0	0 2 7	0 10 3		0 2 7	0 2 7
Bombay	Pre-war	..	0 5 7	..	0 1 10	0 2 6	0 1 10	..
	War	..	0 5 3	..	0 2 11	0 3 6	0 2 11	..
	Post-war 1949-50	..	1 3 8	..	0 10 0	1 1 6	0 8 5	.
Calcutta	Pre-war	..	..	..	..	..	..	..
	War	..	..	..	..	...	..	..
	Post-war 1949-50	0 8 0	1 10 0	..	0 7 0	1 0 0	0 6 0	..
Bangalore	Pre-war	0 1 3	0 2 3	0 1 6	0 2 6	0 6 0	0 0 3	0 0 8
	War	0 4 0	0 3 6	0 7 0	0 4 6	0 14 0	0 0 9	0 2 6
	Post-war 1949-50	..	..	..	..	1 6 0	0 1 9	0 3 6

Market	Period	Sheep and Goats							
		Brain	Tongue	Lungs	Heart	Liver	Kidney	Spleen	Head
Hyderabad	Pre-war	0 0 7	0 0 8	0 1 1	0 4 3		0 0 5	0 0 5	..
	War ..	0 1 8	0 1 8	0 2 7	0 6 10		0 0 10	0 1 3	..
	Post-war 1949-50	0 3 5	0 3 5	0 2 10	0 12 0		0 1 8	0 1 8	..
Bombay	Pre-war	0 3 0	0 1 11	..	..	..	0 9 6	..	0 5 11
	War	0 2 10	0 2 6	..	..	..	0 11 2	..	0 6 4
	Post-war 1949-50	0 5 9	0 4 4	..	..	..	1 10 2	..	0 14 4
Calcutta	Pre-war	0 4 0	0 4 0	0 2 0	0 1 0	0 12 0	0 1 0	0 2 0	..
	War	0 6 0	0 6 0	0 4 0	0 2 0	1 0 0	0 2 0	0 4 0	..
	Post-war 1949-50	0 6 0	0 6 0	..	0 2 0	1 4 0	0 2 0	0 4 6	..
Bangalore	Pre-war	0 1 6	0 0 6	0 2 0	0 1 0	0 2 6	0 0 5	0 0 6	..
	War	0 3 6	0 0 9	0 5 6	0 2 6	0 8 0	0 1 2	0 1 3	..
	Post-war 1949-50	0 5 6	0 1 0	0 6 0	0 3 0	0 11 0	0 2 0	0 2 6	..

APPENDIX No. XIII.

Statement showing the average live weight of goat and dehydrated meat obtained at various factories, as worked out from the total weight, during the period of their working.

Dehydration factory at	Period of working of factory		No. of goats slaughtered during the period of working	Average live weight of goat (lb.)	Average weight of skin, head & offal (lb.)	Average weight of accepted dressed carcase (lb.)	Average weight of sliced meat (lb.)	Average weight of dehydrated meat (lb.)	Proportion of weight of dressed carcase to live weight	Proportion of dehydrated meat to dressed carcase
	From	To								
Poona (*Jhatka*) . . .	3-4-44	30-4-46	487,517	48·5	..	22·5	9·3	2·3	1 : 2·1	1 : 9·8
Madras (*Jhatka*) . . .	6-3-44	15-2-46	344,882	44·0	23·4	19·7	9·5	2·2	1 : 2·2	1 : 8·9
Anantapur (*Halal*) . .	20-4-45	28-2-46	110,826	46·3	27·3	19·0	10·4	2·3	1 : : 2·4	1 : 8·2
Agra (*Halal*) . . .	29-1-44	30-4-46	123,491	..	..	23·9	12·4	2·9	..	1 : 8·2
Patna (*Halal*) . .	17-4-44	30-4-46	166,016	..	..	23·2	11·5	3·0	..	1 : 7·7
Naushera (*Halal*) . .	Mar. '43	30-4-46	417,216	..	..	..	13·3	3·3	..	..
Delhi (*Halal*) . .	24-10-44	30-3-46	141,023	..	..	20·0	10·5	2·2	..	1 : 9·0

Note.—(1) The weight of dehydrated meat from a goat's carcase varies from 2·2 lb. to 3·3 lb. This represents 4·7 per cent to 5 per cent of live weight respectively.

(2) The dressed carcase is 41 ·0 per cent to 46·3 per cent of live weight of goat.

APPENDIX No. XIV.

Bye-laws relating to Markets and Slaughter Houses, made by the Bombay Municipal Corporation under the authority of Section 461, Clauses (k), (l), (m), (n) and (o) and *Section 462 of the Bombay Municipal Corporation Act, 1888 (Bombay Act No. III of 1888), and, confirmed by the Municipal Corporation at a Meeting on 4th April 1895, and by Government by Notification No. 2148, Dated the 27th May 1895, General Department, Published in the "Bombay Government Gazette" of the 30th May 1895, as amended upto-date.*

CHAPTER I—General.

1. *Interpretation of terms.*—In the construction of the Bye-laws hereinafter contained the following words and expressions shall have the meanings hereinafter respectively assigned to them unless such meanings be repugnant to or inconsistent with, the context or subject-matter in which such words expressions occur—that is to say :—

Words importing the singular number shall include the plural, and the plural the singular, and words importing the masculine gender shall include females.

"The Act" means the City of Bombay Municipal Corporation Act, 1888 and includes any Act which may hereafter be passed in substitution for or amendment of the said Act.

"The Commissioner" means the Municipal Commissioner for the greater Bombay appointed under Section 54 of the Act, and includes an Acting Commissioner appointed under sub-section (3) of Section 59 of the Act.

"The Health Officer" means the Municipal Executive Health Officer for the time being appointed or acting under the Act.

"The Superintendent" means the Superintendent of Markets and Slaughter Houses for the time being.

The expression "a standing" shall include any place, space or accommodation, whether defined or not, which may be allotted or allowed to any person resorting to a market for the purpose of sitting thereat as a seller of goods or wares, or for the purpose of placing thereon any stand, bench, board, tray, or other like thing.

Delegation of Powers, Duties and Functions of Commissioner.

2. Any of the powers, duties or functions conferred or imposed upon or vested in the Commissioner by any of the following Bye-laws may be exercised, performed, or discharged under the Commissioner's control, and subject to his revision and to such conditions and limitations, if any, as he shall think fit to prescribe, by any Municipal Officer whom the Commissioner generally or specially empowers in writing in this behalf ; and in each of the said Bye-laws the word "Commissioner" shall, to the extent to which any Municipal Officer is so empowered, be deemed to include such officer.

CHAPTER II—MUNICIPAL MARKETS.

1. *Tenant, etc., to allow free access for inspection.*—Every tenant or occupier of any shop, stall, godown, or standing in a Municipal market, shall at all times, afford free access thereto for purpose of inspection to the Commissioner, the Health Officer, or the Superintendent, or to any Municipal Officer appointed in that behalf by the Commissioner.

2. *Not to bring in goods except those intended for sale, or to allow passages, or approaches to be blocked.*—A tenant or occupier of any shop, stall, godown, or standing in a Municipal market shall not being or cause to be brought into such market any goods, provisions, or marketable commodities, except such as are intended for sale in such market, nor shall he for any longer time or in any other manner than shall be reasonably necessary for the conveyance of such goods, provisions, or marketable commodities to or from such shop, stall, godown, or standing, or any part of such market, place or deposit or cause or allow to be deposited in any passage or place adjoining such, shop, shall, godown, or standing or elsewhere, in such market, or in any of the immediate approaches thereto, any hamper, crate, basket, box, barrel or other receptacle for any goods brought into such market for the purpose of sale or for exposure for sale.

3. *Goods, etc., not to project beyond shops.*—A tenant or occupier of any shop, stall, godown, or standing in a Municipal market shall not cause or allow any goods, provisions, marketable commodities or articles to be deposited or exposed for sale in or upon such shop, stall, godown or standing, so that such goods, provisions, marketable commodities or articles or any part thereof shall project beyond the line of such shop, stall, or godown, or beyond the limits designed to such standing so as to obstruct the passage of any person or of any goods, provisions, marketable commodities, or articles in or through the market or any part thereof.

4. *Shops to be arranged before 6 A.M. and closed before closing hour.*—Every tenant or occupier of any shop, stall, godown, or standing in any Municipal market shall daily arrange his goods before the hour of 6 A.M. and shall remove or put them away, and in the case of tenant or occupier of a shop, stall, or godown, close such shop, stall, or godown before the hour which may for the time being prescribed by the Commissioner as the hour for closing such market so as to admit of the market being thoroughly cleansed.

5. *Shops, etc., to be kept clean.*—Every tenant or occupier of any shop, stall, or godown in Municipal market shall cause the same to be kept in a cleanly condition, shall allow no refuse or garbage to remain about it, but shall cause the same to be put in tub, box, or basket and to be carried to the proper receptacle.

Water not to be wasted.—No person shall waste the water supplied in any Municipal market by the Corporation.

6. *Tenant, etc., of shops and their employees to be decently clad.*—Every tenant or occupier and every servant of a tenant or occupier of any shop, stall, godown or standing in any Municipal market shall at all times be decently and properly dressed when present in the market ; and no tenant or occupier of a stall at which meat or fish is sold shall sit in or upon his stall so as to be in contact with such meat or fish.

7. Except in cases to which clause (b) or clause (c) of Section 407 of the Act applies and subject as to cases coming within clause (c) to such conditions as may be imposed thereunder, no person shall—

(a) occupy or use any shop, stall, godown, standing, bench, table, compartment, place or space in any Municipal market, except as the immediate tenant or occupier thereof from the Corporation.

(b) not being the immediate tenant or occupier from the Corporation or an employee of such immediate tenant or occupier sell or offer or expose for sale, or deposit for sale or otherwise, any articles in or upon any shop, stall, godown, standing, bench, table, compartment, place or space in any Municipal market.

(c) assign, sub-let or part with the possession of any shop, stall, godown, standing, bench, table, compartment, place or space in any Municipal market.

8. *Persons appointed as substitutes for tenants, etc., to be registered.*—Every tenant or occupier of any shop, stall, godown or standing in any Municipal market who shall employ another person to carry on his business at such shop, stall, godown, or standing on his behalf and as his substitute, shall register with the Superintendent of Markets, and from time to time keep so registered, the name of every such employee who may for the time being be deputed to act for him as aforesaid.

Substitutes prohibited by Commissioner not to be employed.—He shall forthwith cease to employ at such shop, stall, godown, or standing as such substitute as aforesaid any person whose employment in that capacity may be prohibited in writing by the Commissioner.

9. *No sales by auction without permission.*—No person shall hold any sale by auction in any Municipal market without the written consent of the Commissioner.

Sale by sample by persons not being tenants, etc., prohibited.—No person who is not a tenant or occupier of a shop, stall, godown, or standing in a Municipal market shall sell articles by sample in such market or its approaches, the bulk being elsewhere, or shall in such market tout for, or take an order for, any article.

Obstruction and laying hand on persons resorting to markets to obtain their customs not allowed.—No person, whether an occupier or not, shall obstruct or lay hand on persons resorting to the market in soliciting their custom.

10. *No hawking; carrying about, or crying of articles for sale.*—No person shall hawk, carry about, or cry any article whatever for sale in any Municipal market.

No noisy instrument to be used to attract purchasers.—No person for the purpose of attracting purchasers to his shop, stall, godown, standing, bench, table, compartment, place, or space, shall use in any Municipal market any bell or other noisy instrument whatever.

11. *No dogs allowed.*—No person shall bring any dog, or knowingly permit any dog to follow him into any Municipal market.

12. *No whistling, shouting offensive language allowed.*—No person shall, in any Municipal market whistle, shout, or make use of any violent obscene, abusive, disgusting, or offensive language.

13. *No smoking. spitting pan-supari juice, or throwing about of orange peel, etc., allowed.*—No person shall, in any Municipal market smoke, spit the juice of 'Pan-supari', or wilfully or negligently throw or drop in or upon any avenue or passage of such market or any of the immediate approaches thereto, any orange peel, vegetable substance or other matter whatsoever to the danger or damage of any person.

14. *No loitering or standing in passages, etc., allowed.*—No person shall loiter or stand in any of the avenues or passages of any Municipal market or its immediate approaches to the annoyance or obstruction of any person.

No person shall remove any meat or offal from any Municipal market without first wrapping the same up in cloth or paper, so that it shall not be exposed to the public view.

No sleeping allowed in markets.—No person shall sleep in or on any shop, stall, godown, or other place within the limits of any Municipal market.

15. *No* helkaris *or coolies to ply in markets unless in employ of tenants, etc., or purchasers.*—No person shall ply for hire as a *helkari* or cooly in any Municipal market unless he be in the service of a tenant or occupier of some shop, stall, godown or standing in such market, or be brought into such market by a person resorting thereto for the purpose of purchasing therein.

Every person plying for hire as a *helkari* or cooly as aforesaid shall wear a badge on the sleeve of his left arm granted to him by the Superintendent, for which a deposit of Re. 1 will be required, together with the name and address of the holder to be entered in a register kept for the purpose, and such badge may be withdrawn at any time.

16. *Directions of Superintendent for maintenance of order to be obeyed.*—No person resorting to a Municipal market as a buyer or seller or as a *helkari* or cooly shall at any time refuse, neglect or omit to comply with any reasonable directions of the Superintendent or any of his assistants for the maintenance of order and regularity.

17. *No tenant, etc., to keep weights and measures other than such as have been verified and stamped in accordance with the Bombay Weights and Measures Act of 1932.*—No tenant or occupier of a shop, stall, godown or standing in a Municipal market shall keep at such shop, stall, godown or standing any weight or measure which has not been duly verified by comparison with the standard weight or measure and stamped in accordance with provisions of the Bombay* Weights and Measures Act of 1932 (Bombay XV 1932), as amended upto date.

18. *Weighment and measurement of goods.*—An officer appointed by the Commissioner in that behalf of the farmer or contractor, to whom the right may have been framed, will attend at the Arthur Crawford Markets or other Municipal markets, at times to be fixed by the Commissioner, for the purpose of weighing and measuring goods and articles. Fees shall be payable therefor as shall be fixed by the Commissioner with the sanction of the Standing Committee.

19. *Goods to be removed after weighment or measurement.*—Every person who brings or causes to be brought any goods or articles to be weighed or measured by the Municipal standard weights or measures, shall immediately after the weighing or measurement thereof is completed, cause the said goods or articles to be forthwith removed.

20. *Short weight of measure and fraudulent packing prohibited.*—No person shall deliver to a purchaser any goods or articles of a less weight or measure than has been represented or that have been fraudulently or deceptively packed.

CHAPTER III—PRIVATE MARKETS.

1. *Free access to be afforded to shops, stalls, etc., for inspection.*—Every owner, lessee, contractor, agent, tenant or occupier of a private market or of any shop, stall, godown or standing therein shall at all times afford free access to every part of the premises for purposes of inspection to the Commissioner, the Health Officer, or the Superintendent, or to any Municipal Officer, appointed in that behalf by the Commissioner.

2. *Licenses to cause markets to be properly lighted.*—Every person to whom a license has been or may be granted by the Commissioner, under Section 403 of the Act, to keep open a private market, shall cause such market to be properly lighted to the satisfaction of the Commissioner by gas or oil lamps or electricity from sunset until the hour which may for the time being be prescribed by the Commissioner as the hour for closing such market.

3. Every person to whom a license has been or may be granted by the Commissioner, under Section 403 of the Act, to keep open

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* Modified by Government Resolution No. 5304, of 14th December 1953.

a private market, shall comply with the following regulations for securing and maintaining such market in a proper sanitary condition:—

(a) *Licenses to limewash twice a year, or oftener if required.*—He shall twice at least in every year, and oftener if required so to do by the Commissioner, cause the said market to be limewashed both internally and externally to the satisfaction of the Commissioner.

(b) *And to paint once in every two years, or oftener if required.*—He shall once at least in every two years and oftener if required so to do by the Commissioner, cause all woodwork or iron work in the building of the said market to be painted to the satisfaction of the Commissioner.

CHAPTER IV—MUNICIPAL SLAUGHTER-HOUSES.

Bandra Slaughter-houses.

1. *Municipal slaughter houses at Bandra for slaughter of animals other than pigs.*—The Municipal slaughter-houses at Bandra are established and set apart for the slaughter of animals other than pigs intended for human food for consumption in the City.

2. *Animals brought for slaughter to be presented for inspection and fair ground fees to be paid.*—A person bringing an animal intended for slaughter to the Municipal slaughter-houses at Bandra shall present such animal for inspection to the Superintendent or his Assistant at the fair ground attached to the said slaughter-houses (and which forms part of the slaughter-house premises) at least 48 hours before the time at which such animal is intended to be slaughtered, and shall pay the fair ground fee for such animal according to the scale for the time being in force.

3. *Officer-in-charge to inspect and brand animals fit for slaughter.*—The Superintendent or his Assistant for the time being incharge at the fair ground, shall inspect and examine every animal so presented, and shall cause to be branded with some distinctive mark (but in such manner as not to cause pain) every such animal which he may consider fit to be slaughtered for human food.

Branded animals admitted to inner yard on payment of slaughter and carrying fees. Time for passing into inner yard.—An animal so marked will, on payment of a slaughter and carrying fee at the rate for the time being in force, be admitted for slaughter into the inner yard of the slaughter-houses, provided that no animal shall be permitted to pass into the inner yard of the slaughter-houses at a later hour in the day than 5 P.M. during the period from 1st October to 28th February or than 5-30 P.M. during the period from 1st March to 30th September.

4. *Animals unfit for slaughter to be rejected and removed.*—The Superintendent or his Assistant whose duty it is to inspect any animal presented for inspection shall reject any such animal which for any reason may appear to him unfit to be slaughtered for human food.

The owner of an animal so rejected shall cause it to be forthwith removed from the slaughter-house premises.

5. *No unbranded animals to be passed into inner yard.*—A person shall not under any circumstances pass or attempt to pass into the inner yard of the slaughter-houses any animal which has not been inspected and branded as fit for slaughter under Bye-law 3 of this Chapter.

Any animal found there unbranded to be removed and if necessary dealt with under Sections 415 *and* 417 *of the Act.*—Any animal which has not been branded as aforesaid found within the inner yard of the slaughter-houses will forthwith be removed from the slaughter-house premises, and if it appears to be diseased, unsound or unfit for human food, will be dealt with pursuant to the provisions of Sections 415 and 417 of the Act.

6. *Animals though branded if found diseased before slaughter to be dealt with under Sections* 415 *and* 417 *of the Act.*—Should an animal which has been inspected and branded, as aforesaid be found before slaughter to be diseased, unsound or otherwise unfit for human food, it will, notwithstanding it has been so branded, be forthwith removed from the slaughter-house premises, to be dealt with pursuant to the provisions of Sections 415 and 417 of the Act.

7. *Carcases of animals though branded, if found diseased, etc., after slaughter, to be dealt with under Section* 416 *of the Act.*—Should the carcases of animal which has been inspected and branded as aforesaid be found after slaughter to be diseased, unsound or otherwise unfit for human food, it will, notwithstanding the animal was so branded, be dealt with pursuant to the provisions of Section 416 of the Act. All fees paid in respect of the animals in Bye-laws 6 and 7 referred to except the slaughter-fee in the case of animal slaughtered, will be refunded on application to the Superintendent.

8. *Butchers and others carrying on business to be licensed.*—Every person desirous of carrying on the business of a butcher, broker, *shroff*, cattle-dealer or hide-dealer, or of otherwise carrying on trade or business, or of working for gain within the limits of the slaughter-house premises, shall obtain from the Commissioner a written permission or ticket or license to enter and carry on such business within the said premises on payment of such annual or other fees as shall from time to time be fixed by the Commissioner with the sanction of the Corporation, and no person shall carry on any such trade or business or work for gain within the limits aforesaid without such written permission or ticket or license.

9. *Animals to be slaughtered without unnecessary pain.*—All animals are to be slaughtered in such a manner as will not cause unnecessary pain or suffering, and in dressing any carcase or portion of a carcase the meat shall not be subjected to the process of 'blowing' or 'fooka' by any person.

10. *No unlicensed persons to enter slaughter-houses or fair ground.*—No person not being the holder of a written permission or tickets or license shall, without the previous permission of the Commissioner, enter the Municipal slaughter-houses or fair ground at Bandra.

11. *No sticks, bludgeons, etc., to be carried.*—No person shall carry any stick, bludgeon or other weapon within the limits of the Municipal slaughter-houses or fair ground at Bandra.

Slaughter-House for Pigs at Arthur Road.

12. *Slaughter house at Arthur Road for pigs.*—The Municipal slaughter-house for pigs at Arthur Road is established and set apart for the slaughter of pigs intended for human food for consumption in the City.

13. *Pigs brought for slaughter to be presented for inspection and slaughter fees to be paid.*—A person bringing pigs intended for slaughter to the Municipal slaughter-house for pigs at Arthur Road shall, present such pigs for inspection by the Superintendent, or his Assistant-in-charge, at the slaughter-house, who shall inspect and examine every pig so presented and shall pass every such pig which he may consider fit to be slaughtered for human food. A pig so passed will, on payment of such slaughter-fee as may from time to time be fixed by the Commissioner with the approval of the Standing Committee under the provisions of Section 407(a) of the Act, be admitted for slaughter in the said slaughter-house. Provided that no slaughter shall, without the previous special permission in writing of the Commissioner, be permitted in such slaughter-house except at night between the hours of 8-30 P.M. and 11-30 P.M.*

Municipal Slaughter-Houses Generally.

14. *Directions of Superintendent for maintenance of order to be obeyed.*—No person resorting to a Municipal slaughter-house for any purpose shall at any time refuse, neglect or omit to comply with any reasonable directions of the Superintendent or any of his Assistant for the maintenance of order and regularity.

CHAPTER V.—PENALTIES

Every person who shall commit any breach ot any of the foregoing Bye-laws contained in Chapters II, III and IV of these Bye-laws shall be liable for every such breach to fine which may exceed to Rs. 20 and in the case of a continuing breach to fine which may extend to Rs. 10 for every day after conviction for the first breach or after receipt of written notice from the Commissioner to discontinue the breach during which the breach continues.

B. K. PATEL
Municipal Commissioner
for Greater Bombay

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* Modified by the Government Resolution No. 5304 of 14th December 1943.

Regulations (approved by the Standing Committee under Section 406 of the Bombay Municipal Corporation Act, 1888) for fixing the hours during which Markets and Slaughter-houses may be kept open, for preventing nuisances and obstructions in Private Markets and for keeping Private Markets in cleanly and proper state, and for removing filth and refuse therefrom, for requiring that Private Markets be properly ventilated and provided with a sufficient supply of water, and for requiring that Passages be provided in Private Markets between the stalls of sufficient width for the convenient use of the public.

1. *Time for opening and closing Municipal and private markets.*—Municipal markets will be opened at 4-30 A.M. and closed at 9-30 P.M. daily, except in the case of mutton and beef sections of Arthur Crawford Market and the mutton section of Erskine Road Market which will be open at 3-30 A.M. Private Markets may be kept open for use between the same hours, but no private market shall, under any circumstances, be opened for use earlier than 4-30 A.M. or be kept open for use later than 9-30 A.M. without the previous special permission in writing of the Commissioner.

2. *Time for keeping Bandra slaughter-house open for use.*—The Municipal slaughter-houses at Bandra will ordinarily be kept open for the slaughter of animals from 5-30 P.M. in the evening until 12 midnight. For special reasons or on occasions of emergency, the Commissioner may from time to time allow the said slaughter-houses to be kept open for the slaughter of animals during any other hours.

3. *Licensees for private markets to keep such peons or ramosis as may be required.*—Every person to whom a licence has been or may be granted by the Commissioner under Section 403 of the Act, to keep open a private market shall employ and keep on duty at such market, during the hours the same is open to the public, so many peons or ramosis as the Commissioner shall prescribe for the purpose of maintaining order and preventing nuisances or obstructions in the market or in the approaches thereto.

4. *Licensees of private markets to enforce compliance by tenants with regulations.*—Every person to whom a licence has been or may be granted by the Commissioner, under Section 403 of the Act to keep open a private market, shall insist on and to enforce compliance by every tenant or occupier of any shop, stall, godown or standing in such market with the following regulations for preventing nuisances or obstructions in such market and in the approaches thereto, and for keeping such market in a cleanly and proper state, namely:—

(a) *For preventing passages and approaches being blocked.*—A tenant or occupier of any shop, stall, godown, or standing, in such market shall not for any longer time or in any other manner than shall be reasonably necessary for the conveyance of any goods provisions or marketable commodities to or from such shop, stall, godown, or standing, or any part of such market, place or deposit or cause or allow to be deposited in any passage or place adjoining such shop, stall, godown or standing or elsewhere in such market, or in any of the immediate approaches thereto, any hamper crate, basket, box, barrel, or other receptacle for any goods, brought into such market for the purpose of sale or of exposure for sale.

(b) *For preventing projection beyond stalls, etc.*—A tenant or occupier of any shop, stall, godown, or standing, in such market shall not cause or allow any goods, provisions, marketable commodities, or articles to be deposited or exposed for sale, in or upon such shop, stall, godown, or standing, so that such goods, provisions, marketable commodities, or articles or any part thereof shall project beyond the line of such shop, stall, godown or beyond the limits assigned to such standing, so as to obstruct the passage of any persons or of any goods, provisions, marketable commodities, or articles, in or through the market or any part thereof.

(c) *For keeping stalls, etc., in a cleanly condition and for preventing refuse or garbage, from collecting.*—Every tenant or occupier of any shop, stall, standing, or godown in such market shall cause such shop, stall, standing or godown, to be kept in a cleanly condition, and shall allow no refuse or garbage to remain about it, but shall cause the same to be put in the receptacles kept in the market.

For this purpose every person to whom a licence to keep open a private market is granted by the Commissioner under Section 403 of the Municipal Corporation Act shall provide a sufficient number of suitable, covered, airtight, and non-absorbant receptacles and they shall at all times be kept in good repair and condition and provided in such manner and at such places as the Superintendent of markets may from time to time direct.

5. *Licensees for private markets to obtain water-connection, etc.*—Every person to whom a licence has been or may be granted by the Commissioner, under Section 403 of the Act to keep open a private market shall cause or procure to be laid into the premises a water connection of not less than one inch in diameter from the Municipal water main and shall cause such connection and all fittings thereof to be kept at all times in proper order and efficient action so as to provide for use on the premises a sufficient supply of water for the purpose of thoroughly washing and cleansing the premises. And shall also cause to be provided a washing place of such dimensions with such number of water taps as may be directed by the Commissioner.

To cause filth, garbage, etc., to be promptly removed to receptacle on place for temporary deposit.—He shall cause all filth, garbage, and refuse which may be produced or may accumulate in any part of such market to be promptly removed, in such a manner and with such precautions, as not to create a nuisance in the process of removal, to such public receptacles, depot, or place as may for the time being be provided or appointed by the Commissioner for the temporary deposit thereof.

To cause market to be swept and cleansed twice each day and washed down daily.—He shall cause such market to be thoroughly swept and cleansed to the satisfaction of the Commissioner each morning and evening and to be washed down with disinfectants every evening.

He shall cause every stall or bench on which articles of food or drink are kept, or exposed for sale, to be thoroughly cleansed daily and every board or place on which meat or fish is kept to be scraped.

He shall cause every approach and passage or gangway to be paved or metalled or gravelled and sloped and drained to the satisfaction of the Commissioner.

He shall cause every drain or means of drainage provided upon or in connection with the premises to be maintained at all times in good order and efficient action.

He shall not permit or suffer any market, stall, or godown, in the premises to be used at any time for the purpose of cooking or human habitation.

He shall at all times provide on the premises a sufficient quantity of hycol powder or such other disinfectants as the Superintendent of Markets may prescribe for destroying the foodstuff condemned by the Municipal staff in such a way as to prevent the stuff so on being exposed for sale or used as food.

No leper or any person suffering from an open sore or any loathsome, infectious, or contagious diseases shall be permitted to carry on any business or assist in the carrying on of any business in such premises or to be allowed to enter or live in any part of such premises.

No dogs, cats, sheep, goats, or cattle shall be permitted in the premises.

6. *Licensees of private markets to comply with regulations for proper ventilation.*—Every person to whom a licence has been or may be granted by the Commissioner to keep open a private market shall observe and comply with the following regulations for the proper ventilation of such market :—

(a) A clear open space of not less than 30 feet in width properly paved and drained shall be maintained all round the market, provided that this regulation may be relaxed by the Commissioner in special cases.*

(b) At least one entrance of not less than 10 feet in width shall be maintained in front of the market if the said market does not exceed 60 feet in length in front ; if it exceeds that length, then at least two entrances, each of not less than 10 feet in width, shall be maintained.

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* Modified by the Standing Committee Resolution No. 16 of 7th April 1943.

(c) In all cases in which gates are provided to any entrance to the market, such gates shall be constructed of iron-work or open wood-work.

(d) The entrance shall be so placed as to secure a free circulation of air throughout the market.

(e) The walls or roof columns shall not be less than 20 feet in height from the floor of the market to the wall plate or tie bar, and no lofts or other similar structures shall be erected under the roof.

(f) The roofs shall have ridge ventilation throughout their length and shall be fitted with movable louvre boards or shutters which can be closed in wet weather.

(g) In the space between each roof truss and under the projecting caves of gutter way an opening shall be kept at the top of the wall for not less than half length of the space and not less than 18 inches deep. This opening may be grated or covered with wire netting to keep out birds.

(h) If the market has brick or masonry built walls, there shall be in every 10 feet of wall length at least one window of not less than 8 feet in height and 4 feet in width, and such windows shall be not less than 8 feet above the floor level.

(i) If the market is supported on pillars and has open sides fitted with shutters, such shutters shall be so arranged and fitted as not to obstruct ventilation.

Provided that the regulations herein above set out may be waived by the Commissioner in respect of the "squatters' markets" permitted to be held on vacant plots of land.

7. *Passages in Market to be not less than 8 feet in width.*—Passages or spaces not less than 8 feet in width shall be maintained between the rows of stalls, standing or benches in each market.

APPENDIX No. XV.

Municipal Slaughter-houses.

Bye-laws under Section 559(34) regulating the use of Municipal slaughter-houses.

(Sanctioned by the Local Government on 23rd Dec. 1903 and published in the Calcutta Gazette of 30th December, 1903).

Amended by Notification No. 1086-M, dated the 20th March 1916, published in the Calcutta Gazette on the 22nd March 1916, Part I-B, page 77 (bye-laws 37.43).

Amended by Notification No. 738 T.M., dated the 9th October, 1918, published in the Calcutta Gazette on 23rd Oct., 1918, Part I-B, page 653 (bye-laws 10+13, 15, 34, 37, 40 & 41).

1. *Access.*—Butchers and others shall have access to a slaughter-house only for the purpose of slaughtering animals intended for human food and for the resulting purposes of skinning, cutting up and cleaning carcases of animals so slaughtered therein and on the conditions hereunder specified.

2. *Grant of Licence, etc.*—A person desirous of having the right to slaughter animals in a slaughter-house and shall apply to the Chairman for a license. No person shall without or otherwise than in conformity with the terms of a licence granted by the Chairman in that behalf have the right to slaughter animals in a slaughter-house. The granting of a license shall be discretionary.

3. *Licence fee and other particulars.*—The licence granted by the Chairman shall have effect and continue in force from the commencement to the end of the financial year on account of which it is granted, and shall state the name of the person to whom and the slaughter-house in respect of which it is granted and place or portion of such slaughter-house assigned to the licence and shall state that it is granted subject to the terms of section 492 of the Act. There shall be paid for each licence a fee of Rs. 5/-.

4. *Issue of ticket, etc.*—A licencee shall apply to the Superintendent for a ticket for each person who is to act on his behalf or as his assistant in slaughtering animals. The ticket shall specify the name of the person in respect of whom it is issued and the place in or portion of the slaughter-house assigned to the licencee. The ticket shall be issued free of charge, and shall remain in force for the same period as the licence granted to the licencee.

5. *Licence of ticket non-transferable.*—No licence or ticket shall be transferable.

6. *Slaughtering to be done in the assigned place only.*—No place in or portion of a slaughter-house other than that assigned to the licencee and specified in the licence shall be used by either the licencee or any assistant holding a ticket for slaughtering animals.

7. A licencee or ticket holder shall produce his licence or ticket, as the case may be, whenever he shall be required to do by any Commissioner or by the Superintendent or other Municipal Officer.

8. *Notification of time of slaughtering.*—Animals shall be slaughtered in a slaughter-house only on such days and during such hours as shall from time to time be fixed by the Chairman by regulation made in accordance with Section 488 of the Act. A notice signed by the Superintendent and countersigned by Health Officer shall be affixed in a conspicuous place in the slaughter house naming such days and hours.

9. *Access of persons during working hours.*—None, but licensees, ticket holders, Municipal Commissioners and Municipal Officers shall have access to a slaughter-house during the hours fixed for slaughtering animals and during the process of skinning, cutting up, cleaning and stamping the carcases.

10. * *

11. *Lapse of time before slaughtering animals dying from accident to be slaughtered at once, etc.*—No animal, other than an animal which is dying from injury sustained in an accident and which is brought to a slaughter-house immediately after the accident and which shall be killed at once, shall be slaughtered until after the lapse of 24 hours from the time it is brought to a slaughter-house or any stockyard appertaining thereto and during the period an animal is confined in such premises, the Superintendent shall see that it is provided during such confinement with a proper supply of wholesome water.

12. *Examination of animals.*—All animals brought to a slaughter-house or any stock-yard appertaining thereto, shall be carefully examined by the Superintendent, and no animal shall be slaughtered until it has been so examined and pronounced by the Superintendent to be free from disease.

13. *Exclusion of diseased, dying (except from injury) or dead animal.*—No person shall bring diseased, dying or dead animal to a slaughter-house or any stock-yard appertaining thereto.

This bye-law shall not apply in the case of an otherwise healthy animal which is dying from injury sustained in an accident and which is brought to a slaughter-house or any stock-yard appertaining thereto, immediately after accident.

14. *Diseased animal not to be slaughtered.*—No animal which upon examination is found to be diseased or shows symptoms of or is suspected of being diseased shall be slaughtered at a slaughter-house.

15. *Segregation of diseased animals in a special pen, etc.*—A special pen shall be attached to every slaughter-house or stock-yard appertaining thereto for the segregation of animals which are found to show symptoms of or are suspected of being diseased, and every animal which upon examination is found to show symptoms of or be

suspected of being diseased shall be atonce removed to such special pen and there kept under observation for such period as may be necessary to ascertain whether, it is diseased or not. The cost of maintenance of any animal kept in the special pen shall be paid by the person bringing the animal to the slaughter-house or stock-yard appertaining thereto.

16. Every animal which shall be found to be suffering from an infectious or contagious disease shall be removed to the Municipal knackery or such other place as the Chairman may from time to time appoint to be there destroyed or disposed of in such manner as to prevent any portion of the carcase being used as human food. A report of every such case shall be made to the Chairman forthwith.

17. *Dying (except) from injury or dead animals treated as infected animals.*—A dying or dead animal brought to a slaughter-house shall be treated as an animal suffering from an infectious or contagious disease provided that an animal which is dying as the result of an accident and is brought to a slaughter-house immediately after the accident, may, if upon examination, be found to be free from any disease, be allowed to be slaughtered for human food.

18. *Animal with young not to be slaughtered.*—No animal, that is, or is suspected to be, with young shall be slaughtered at a slaughter-house.

19. *Skinning and examination of skin.*—The carcase of every animal which has been slaughtered in a slaughter-house shall be immediately skinned and cleaned by the person who slaughtered it, and shall, after it has been skinned be carefully examined by the Superintendent to ascertain if it is free from disease. The skin shall likewise be carefully examined by the Superintendent to ascertain if it is free from disease.

20. *Destruction of diseased carcase.*—Every carcase which upon examination is found to be diseased shall be seized by the Superintendent and with the consent of the owner or the person who brought the animal to the slaughter-house, be forthwith destroyed in such manner as to prevent its being used for human food or if in any case such consent be not obtained, then, if the carcase is, in the opinion of the Chairman, the Health Officer or District Health Officer, diseased, it may be destroyed as aforesaid. The expenses incurred in destroying such animals shall be paid by the person in whose possession it was at the time of its seizure.

Destruction of skin or carcase showing symptoms of contagious disease ownership of skin.—In any case when either the skin or carcase shall show symptoms of a contagious disease, the skin shall be destroyed by the Superintendent, in all other cases the skin shall remain the property of the owner. In the event of any dispute between the Superintendent and the owner of a carcase or skin as to whether a carcase or skin is diseased or not, the matter shall be referred to the Health Officer, whose decision shall be final.

21. *Disposal of diseased meat and offal.*—All meat and offal which upon examination are found to be diseased or are unfit for human food shall be seized and dealt with in the same manner as the diseased carcase.

22. *Stamping of skinned carcase.*—Immediately after examination every skinned carcase which is found to be free from disease and fit for human food shall be stamped over the body by the Superintendent before the carcase is quartered or cut up. Such stamping shall be done with such stamp and due as may be from time to time prescribed by the Health Officer with the Chairman's approval.

23. *Classification of carcases.*—Skinned carcases qualified for stamping shall be divided into three classes numbered 1, 2 & 3 according to the quality of the meat, and stamps shall be provided for each class and every carcase shall be stamped with the stamp designating with the class to which the carcase is assigned. The Supdt. shall decide to what class each carcase is to be assigned, and in the event of any dispute the matter shall be referred to the Health Officer, whose decision shall be final.

24. *Blowing of carcases.*—No person shall blow by insufflation or any other process the carcase of any animal slaughtered for human food and every person assisting in this process shall be held to have committed an offence under these regulations.

25. *Prevention of blood flowing over the floor.*—Every animal slaughtered in a slaughter-house shall be slaughtered in such a manner as to prevent the blood of the animal from flowing over the floor.

26. The skins, entrails and offal of slaughtered animals which have been found to be free from disease shall be removed to a special offal room in the slaughter-house which will be provided for the purpose and shall be washed and cleaned there before their removal.

27. All refuse and offal rejected by the owners of slaughtered animals shall be deposited by them or their assistants in a municipal offal truck which will be provided for the purpose and shall be disposed of as the Chairman may direct.

28. The solid contents of the entrails of slaughtered animals shall not be washed into the sewers, but shall be removed by the person who slaughtered the animals or their assistants and deposited in a municipal offal truck which will be provided for the purpose and shall be disposed of as the chairman shall direct.

29. *Cleansing the floor and wall after slaughter.*—Every person who slaughters an animal in a slaughter-house shall cause the portion of the floor of the slaughter-house where the animal has been slaughtered and any adjoining wall to be thoroughly washed and cleaned immediately after the slaughter of the animals, so as to

prevent the absorption therein if any blood or liquid. refuse or filth which may be spilled or splashed therein or any offensive or noxious matter which may be deposited thereon or brought in contact herewith.

30. *Disposal of offal entrail, etc.*—All skins, offal and entrails, etc., left at a slaughter-house after such hour as the Superintendent shall, with the sanction of the chairman prescribe shall be considered to be refuse and shall become the property of the Corporation and shall be disposed of as the chairman direct.

31. *Sale of meat skin offal in the slaughter-house.*—No person shall sell meat in retail on the premises of a slaughter-house. Skins and offal may be sold in the yard of a slaughter-house but no purchaser of any skins and offals shall on any pretext enter any portion of the slaughter-house or any building forming a part thereof.

32. *Meat, etc., for food to be removed in clean cover receptacle, etc.*—All meat entrails and offal which are fit for human food and are permitted to be removed from a slaughter-house shall be removed in covered baskets and carts which together with their cover shall be at all times kept clean and shall be produced daily to the Superintendent or his assistants whose duty it shall be to inspect them and see that they are kept clean.

33. *Receipt certificate to be obtained after slaughtering, etc.*—Every person who slaughters in a slaughter-house any animal the carcase thereof is found to be free from disease and fit for human food shall every day before leaving the slaughter-house obtain from the Superintendent a receipt stating the number and class of animals slaughtered by him and the date and time when they were slaughtered and the name of the persons who slaughtered the animals and counterfoils of all such receipts shall be filled in and kept by the Superintendent.

34. *Exclusion of suffers from infectious diseases.*—No person suffering from leprosy sores or any disease of the skin or any contagious or infectious disease shall enter a slaughter-house or any part of the premises or any store-yard appertaining thereto.

35. No dog shall be admitted into a slaughter-house or any stock-yard appertaining thereto. Every dog found therein shall be atonce made over to the Police to be dealt with as stray dog.

36. *Substitute* the following for clause 36 bye-law 559(34).

The slaughter of calves other than those vaccinated at the Government Department, is prohibited, and no calf will be permitted to be brought to a slaughter-house or any store-yard appertaining thereto for the purpose of being slaughtered without the production of certificate signed by the Superintendent of either the Government Vaccine Department or the Municipal Vaccine Department to the effect that such calf has passed through such vaccine department.

37. *Substitute* the following for the amendment clause 37(1) bye-laws 559(34) in correction slip No. 23.

37(i) All animals brought for slaughter at a slaughter-house except goats, must pass through the stock-yard appertaining thereto, if such stock-yard is available for use or occupation, and shall be kept there for a period of not less than 24 hours before slaughter, during which time or any subsequent extention thereof, the animals shall be fed and watered at the expense of the Corporation.

Provided that no animal shall be kept in the stock-yard for more than 10 days.

37(ii) The fees for admission into the stock-yard which shall be in addition to any slaughtering fee for each animal that may from time to time be imposed under Section 439 shall be in accordance with the scale of fees which has been fixed under that section or such other fees as may from time to time be fixed in that behalf under the said section.

38. *Animals for immediate slaughter to be brought into the place of slaughter.*—No animals, other than those which the Supdt. has passed as fit for slaughter and which are intended for immediate slaughter, shall be brought into that portion of the slaughter-house which shall be set apart for the slaughter of the animals.

39. *Disorderliness entailing ejectment of the offender.*—No person shall make a noise, fight or quarrel, use insulting, abusive or obscene language in a slaughter-house or any stock-yard appertaining thereto. Persons contravening these regulations may be summarily ejected by the Superintendent or his assistants.

40. *Illegal gratification.*—No employee of the Corporation shall ask for or receive any gratuity in money or otherwise from any person making use of a slaughter-house or any stock-yard appertaining thereto.

Penalty clause.

Any person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a fine which may extend to Rs. 20/- and in the case of a continuing breach to a fine which may extend Rs. 10/- for every day during which the breach continues after conviction for the first breach.

APPENDIX No. XVI

[ANIMAL CONTROL—SLAUGHTER-HOUSE—PUBLIC]

Bye-laws under Section 349 (14) (*a*), (*b*) *and* (*c*) *of the Madras City Municipal Act IV of* 1919, *for the control and supervision of municipal slaughter-houses, or of places used for skinning and cutting up carcases, of the methods of slaughtering and of butchers carrying on business in them.*

1. Every applicant for a licence to slaughter animals in a Corporation slaughter-house shall produce before the Commissioner a certificate of health from a Registered Medical Practitioner.

2. Every person who desires to slaughter an animal in a municipal slaughter-house shall produce his licence when called on to do so by the Commissioner or the Health Officer or Superintendent or any person in charge thereof.

3. Licences shall slaughter animals and dress carcases only in such places in the slaughter-house as are assigned for such purposes by the Superintendent thereof.

4. Licensees shall slaughter animals only at such hours as may from time to time be fixed by the Commissioner and notified in some conspicuous place in the slaughter-house.

5. (i) A licensee shall not slaughter an animal until it has been carefully inspected and pronounced to be free from disease by an officer (hereinafter referred to as the Inspecting Officer).

(ii) The Inspecting Officer shall reject any animal which may for any reason appear to him to be unfit to be slaughtered for human consumption.

(iii) The owner of the animal so rejected shall cause it to be forthwith removed from the slaughter-house premises.

(iv) If any animal so rejected is found to be affected with any infectious or contagious disease the Inspecting Officer shall seize and destroy such animal and dispose of the carcase in such manner as to prevent its being used for human food or exposed for sale. The owner of the animal shall bear all expenses that may be incurred in such seizure, destruction and disposal.

6. No person shall bring into a slaughter-house a dying or dead animal. The Inspecting Officer may, if such animal is brought to the slaughter-house, direct that it shall be seized and destroyed and the carcase disposed of in such manner as he deems fit. The owner of the animal shall bear all the expenses that may be incurred in such seizure, destruction and disposal.

Explanation.—This bye-law shall not apply to the case of an animal which has met with an accident rendering it unfit for further work, if it is brought to the slaughter-house immediately after the accident.

7. Every person employed in the slaughtering of animals shall use such instruments and appliances and shall adopt such methods of slaughtering and otherwise take such precautions as may be requisite to secure the infliction of as little pain or suffering as practicable.

8. The carcases of all slaughtered animals shall be examined by the officer appointed by the Commissioner in this behalf. If any such carcase be found to be diseased, unsound or otherwise unfit for human consumption, it shall be seized and destroyed and disposed of so as to prevent its being used for human food or exposed for sale at the expense of the person in charge of the carcase at the time of seizure, except in cases of contagious or other diseases, the skin of the animal shall remain the property of the owner.

9. All carcases passed by the officer referred to in bye-law 8 as fit for human consumption shall be stamped before removal from the slaughter-house. If any dispute arises between such officer and the person in charge of a carcase as to its fitness for human food or otherwise, the dispute shall be referred to the Health Officer or Assistant Health Officer whose decision shall be final.

10. Every person engaged in a slaughter-house in driving or bringing any animal to the place of slaughter shall (a) avoid as far as practicable driving or bringing the animal over any ground which is likely to cause the animal to slip or fall and (b) otherwise adopt such methods and precautions as will prevent the infliction upon the animal of unnecessary suffering or pain.

11. No person shall, in a slaughter-house, slaughter or cause or suffer to be slaughtered any animal or cause or suffer its carcase to be dressed in the view of another animal.

12. Every person who brings animals into the slaughter-house for slaughter shall keep them at the pen provided for the purpose for such period as may be fixed by the Commissioner from time to time, or any subsequent extension of such period, provided that no animal shall be so kept for more than one week. The animals shall be fed at the expense of such person.

13. No person shall remove carcases and meat from a slaughter-house to any market or other place except in a suitable covered vehicle of an approved pattern and specially set apart for the purpose. Such person shall, during such removal, conceal the carcases and meat from public view and completely protect them from flies and dust. Persons providing such vehicles shall at all times keep the same in a clean and sanitary condition and in good order and repair. Where such vehicles are provided by the Corporation, no person shall remove the carcases and meat except in a vehicle so provided and such carting fees as may be fixed by the Standing Committee from time to time shall be paid for the use of the vehicle.

14. The licensee shall not allow the contents of the entrails, refuse, offal and other offensive matter rejected by him, to be washed or let into the sewer or drain but shall remove and deposit them in the offal baskets or other receptacle provided for the purpose.

15. The licensee shall remove skins, entrails, and other offal from the slaughter-house premises within three hours after the slaughtering or dressing had been completed. Those not removed within the time allowed shall be considered to have been abandoned and shall become the absolute property of the Corporation and the Health Officer shall dispose of them as he thinks fit.

16. The licensee shall not sell meat in the slaughter-house, but offal and skins may be sold, in such parts of the slaughter-house as may be assigned for the purpose and at such hours, as may be fixed by the Commissioner.

17. Every licensee shall be responsible for any damage done to the slaughter-house either by his own act or the act of his servants and any such licensee refusing to pay for such damage done to the property of the Corporation shall have his licence cancelled and the amount of such damage shall be recoverable as prescribed by section 395 of the Act.

18. No person shall insufflate or flow carcases not shall the licensee permit any person to do so.

19. No leper and no person suffering from an open sore or any loathsome, infectious or contagious disease shall enter a slaughter-house, nor shall a leper or any person suffering as aforesaid be employed by a licensee to remove, or assist in the removal of, any carcase or meat from the slaughter-house.

20. No dog shall be permitted to enter any slaughter-house and any dog found therein may be dealt with as a stray dog and destroyed by the Corporation.

21. Any person who is found drunk or disorderly or begging or loitering or making a noise or quarrelling or using insulting, abusive or obscene language or misconducting himself in any manner in any slaughter-house premises shall be expelled therefrom by the Superintendent or any other officer in charge thereof.

22. No person shall spit in any slaughter-house except in such receptacles or places as are provided for such purpose.

23. Whoever commits a breach of any of the above bye-laws except bye-laws 1, 8, 17 and 21 shall be punishable—

(a) with fine which may extend to fifty rupees and in case of a continuing breach with fine which may extend to fifteen rupees for every day during which the breach continues after conviction for the first breach ; or

(b) with fine which may extend to ten rupees for every day during which the breach continues after receipt of notice from the Commissioner to discontinue such breach.

[ANIMAL CONTROL—SLAUGHTER-HOUSE—PRIVATE]

Bye-laws under Section 349 (14) (*a*) (*b*) *and* (*c*) *of the Madras City Municipal Act IV of* 1919 *to provide for the control and supervision of private slaughter-houses or places used for skinning or cutting up carcases, of the methods of slaughtering in them and of butchers carrying on the business in them.*

1. Every application for a license under Section 295 of the Act shall be accompanied by—

(i) the opinion of the Health Officer as to the fitness of the place mentioned in the application for use as a slaughter-house ; and

(ii) a plan in duplicate of such place showing clearly the several portions thereof proposed to be used as the slaughtering yard, the skinning place, the airing room, etc., and all other arrangements required for the purpose together with a statement of the particulars mentioned in the schedule.

2. Every person who has obtained a licence from the Commissioner for the use of any premises as a private slaughter-house shall permit any Municipal Officer deputed for the purpose to enter the slaughter-house at any time by day or by night, without notice, and inspect the same.

3. No person shall use any premises, or permit any premises to be used, for the purpose of a slaughter-house or as a lair for cattle kept in connexion therewith—

(i) unless such premises are situated in open ground at a distance of not less than 100 yards from the nearest human habitation or well or other source of domestic water-supply ; and

(ii) unless they are constructed in accordance with the provisions of bye-laws 4 to 7.

4. Every private slaughter-house shall be constructed of masonry and no part thereof shall be constructed of inflammable materials.

5. Every private slaughter-house shall be suitably enclosed by a masonry wall not less than 6 feet high and shall be provided with suitable gateways and gates, and otherwise fully screened from public view.

6. The approach to every private slaughter-house shall not be on an incline of more than 1 in 4 and shall not pass through any dwelling house or shop.

7. The floor of every private slaughter-house shall be at least one foot above the level of the adjoining ground.

8. The owner or occupier of any premises who has obtained from the Commissioner a licence for the use of any premises as a private slaughter-house shall cause every part of such slaughter-house to

be paved or otherwise made impervious. He shall cause the floor to be sufficiently smooth and sloped towards an impervious masonry drain discharging into an impervious masonry cistern situated outside the slaughter-house. He shall construct the cistern to be of such dimension as to hold not less than 24 hours flow of waste water from such slaughter-house and cause it to be closely covered and fitted with an air-tight frame and cover and to be completely emptied and cleaned at least once in every 24 hours.

9. He shall cause every part of the compound of such slaughter-house to be paved or metalled and drained to the satisfaction of the Health Officer ; and shall cause it to be maintained at all times in good order and repair.

10. He shall provide suitable means of ventilation communicating directly with the external air, and lighting upon or in connexion with such private slaughter-house and shall cause the same to be maintained at all times in good order and efficient action.

11. He shall cause every part of the walls and every part of the floor or pavement of such slaughter-house to be maintained at all times in good order and repair so as to prevent the absorption therein of any blood or liquid, refuse or filth which may be spilled or splashed thereon or any offensive matter which may be deposited thereon or brought into contact therewith.

12. He shall provide in such slaughter-house a sufficient supply of pure and wholesome water.

13. He shall provide suitable latrine accommodation for persons employed in or using such slaughter-house. He shall construct such latrine or any cesspool attached thereto outside the slaughter-house and its enclosing wall.

14. He shall not permit or suffer any part of such slaughter-house to be used at any time for purposes of human habitation nor shall he permit or suffer any fires to be lighted or any cooking to be done therein.

15. He shall cause every drain or means of drainage which may be provided upon or in connexion with such slaughter-house to be maintained at all times in good order and efficient action.

16. He shall cause such slaughter-house to be thoroughly washed and cleansed within three hours after the completion of the slaughtering or dressing and he shall prevent any accumulation of filth or refuse therein.

17. He shall provide suitable covered air-tight non-absorbent receptacles for the deposit of all refuse matter and shall cause such receptacles to be emptied not less than twice in every 24 hours or more often if so required by the Health Officer : and disposed of in such manner as may be approved by him.

18. He shall not pass or permit to be passed any solid refuse matter or any solid contents of entrails into any public or private sewer or drain.

19. He shall cause every part of the internal surface of the walls and ceiling of such slaughter-house to be hot limewashed at least four times in every year in the months of January, April, July and October or more often if so required by the Health Officer.

20. No person shall spit in or upon any part of such slaughter-house except in such receptacles or places as are provided for such purpose, nor shall the licensee permit any person to spit except in such receptacles or places as aforesaid.

21. The licensee shall provide in such slaughter-house such means and appliances as the Health Officer may prescribe to enable the dressing of carcases to be carried on in a clean and sanitary manner.

22. He shall permit the slaughtering of animals in such slaughter-house only during such hours as may, from time to time, be prescribed by the Health Officer.

23. He shall not keep or pen therein any animals intended for slaughter but shall collect them for purposes of inspection at such time and place as may be appointed by the Commissioner and shall not slaughter any animal until it has been inspected and pronounced to be free from disease by an officer (hereinafter referred to as the Inspecting Officer) appointed by the Commissioner in this behalf.

24. The Inspecting Officer shall reject such animals as may for any reason appear to him unfit to be slaughtered for human consumption. The owner of an animal so rejected shall cause it to be forthwith removed ; but any such animal if found to be affected with infectious or contagious disease shall be seized and destroyed and disposed of in such manner as to prevent its being used for human food or exposed for sale and any expenses that may be incurred in such seizure, destruction and disposal shall be borne by the owner of the animal.

25. The licensee shall not admit any dying or dead animal into the slaughter-house, nor shall he admit any animal found to be affected with infectious or contagious disease but shall forthwith intimate to the Health Officer the facts of the case and segregate the animals in an isolated part of the building and shall not return them to the owner until the animals have been inspected by an officer of the Madras Corporation and necessary orders are issued by him thereon.

Explanation.—This bye-law shall not apply to the case of an animal which has met with an accident rendering it unfit for further work, if it is brought to the slaughter-house immediately after the accident.

26. Every person employed in the slaughtering of animals in any private slaughter-house shall use such instruments and appliances and shall adopt such methods of slaughtering and otherwise take such precautions as may be requisite to secure the infliction of as little pain or suffering as practicable.

27. Every person engaged in a slaughter-house in driving or bringing any animal to the place of slaughter shall (a) avoid so far as practicable driving or bringing the animal over any ground which is likely to cause the animal to slip or fall and (b) otherwise adopt such methods and precautions as will prevent the infliction upon the animal of unnecessary suffering or pain.

28. No person shall in a slaughter-house slaughter or cause or suffer to be slaughtered any animal or cause or suffer its carcase to be dressed in the view of another animal.

29. The licensee shall not cause or allow any blood or other refuse to flow from such slaughter-house so as to be within the sight or (so far as it is practicable to avoid it) within the smell of any animal in the slaughter-house and he shall not cause or allow any such blood or other refuse to be deposited in the waiting pens or lairs.

30. Every person who brings animals into a slaughter-house for slaughter shall keep them at the waiting pen or lair provided for the purpose, for a period of not less than 48 hours before slaughter, and during such time or any subsequent extension thereof, the animals shall be fed at the expense of such person.

31. An officer appointed by the Commissioner shall stamp all carcases and meat from a private slaughter-house. No person shall remove carcases and meat from a slaughter-house to any market or other place except in a suitable covered vehicle of a pattern and size approved by the Health Officer and specially set apart for the purpose. Such person shall, during such removal conceal the carcases and meat from the public view and completely protect them from flies and dust. Persons providing such vehicles shall at all times keep the same in a clean and sanitary condition and in good order and repair.

32. The licensee shall not permit the sale of meat in any private slaughter-house but may allow the sale of offal and skins in such places as may be assigned therein for such purposes and at such hours as may be fixed by the Health Officer.

33. The licensee shall cause the removal from such slaughter-house, skins, entrails and all other offal within three hours of the completion of slaughtering or dressing.

34. No person shall insufflate or blow any carcase.

35. No leper and no person suffering from an open sore or any loathsome, infectious or contagious disease shall enter any private slaughter-house, nor shall a leper or any person suffering as aforesaid be employed by the licensee to remove or assist in the removal of carcases or meat from the slaughter-house.

36. No dog shall be kept or permitted in any private slaughter-house. Any dogs found therein shall be dealt with as stray dogs.

37. Whoever commits a breach of any of the above bye-laws except bye-law 1 shall be punishable—

(a) with fine which may extend to fifty rupees and in the case of a continuing breach with fine which may extend to fifteen rupees for every day during which the breach continues after conviction for the first breach, or

(b) with fine which may extend to ten rupees for every day during which the breach continues after receipt of notice from the Commissioner to discontinue such breach.

Statement of particulars to accompany the application for a licence.

Name and address of the owner of the premises.

Nature and condition of applicant's tenure of the premises.

Whether he is the sole owner, lessee, or tenant or whether jointly interested with any other person or persons and if so with whom :

(1) Boundaries, area, the description of the proposed site of the premises to be erected for use and occupation as a slaughter-house.

(2) Description of the premises to be erected on such site—

(a) Nature, position, form, superficial area and cubical contents of the several buildings therein comprised.

(b) Extent of paved area in such buildings and materials to be employed in the paving of such area.

(c) Mode of construction of the internal surface of the walls of such buildings and materials to be employed in such construction.

(d) Means of water-supply position, form, materials, mode of construction and capacity of the several cisterns, or tanks or other receptacles for water to be constructed for permanent use in or upon the premises.

(e) Means of drainage, position, size, materials, and mode of construction of the several drains.

(f) Means of lighting and ventilation.

(g) Means of access for cattle from the nearest street or public thoroughfare.

(h) Number, position, and dimensions of the several pounds, stalls, pens or lairs to be provided on the premises.

(i) Number of animals for which accommodation will be provided in such pounds, stalls, pens, or lairs distinguishing—

(1) Oxen, buffaloes and cows, (2) calves, (3) sheep and lamb, (4) swine.

APPENDIX No. XVII

THE WEST BENGAL ANIMAL SLAUGHTER CONTROL BILL, 1950

A
BILL

to control the slaughter of certain animals.

Whereas it is expedient to control the slaughter of certain animals with a view to increase the supply of milk and to avoid the wastage of animal power necessary for improvement of Agriculture;

It is hereby enacted as follows:—

1. *Short title, extent and commencement.*—(1) This Act may be called the West Bengal Animal Slaughter Control Act, 1950.

(2) It extends to the whole of West Bengal.

(3) It shall come into force on such date or dates as the Provincial Government may, by notification in the Official Gazette, appoint and different dates may be appointed for different parts of West Bengal.

2. *Application of Act.*—This Act applies to the animals specified in the schedule.

3. *Definitions.*—In this Act, unless there is anything repugnant in the subject or context,—

(i) "animal" means an animal to which this Act applies;

(ii) "Calcutta" has the same meaning as in clause (II) of section 3 of the Calcutta Municipal Act, 1923;

[Ben. Act III of 1923.]

(iii) "President of a municipality" means any person presiding over the affairs of any municipal authority by whatever name he may be called, and includes any person nominated by him for the purposes of this Act;

(iv) "prescribed" means prescribed by rules made under this Act;

(v) "Veterinary Assistant Surgeon" means,—

(a) in areas other than Calcutta, a Veterinary Assistant Surgeon, and

(b) in Calcutta, a Veterinary Assistant Surgeon of the West Bengal Civil Veterinary Department acting within the local limits of his jurisdiction; and

(vi) "Veterinary Officer" means,—

(a) in areas other than Calcutta, a District Veterinary Officer, and

(b) in Calcutta, a Superintendent of Veterinary Services (Headquarters) of the West Bengal Civil Veterinary Department acting within the local limits of his jurisdiction.

4. *Pohibition of slaughter of animal without certificate.*—(1) Notwithstanding anything in any other law for the time being in force or in any usage to the contrary, no person shall slaughter any animal unless he has obtained in respect thereof a certificate under sub-section (2) or sub-section (3) that the animal is fit for slaughter.

(2) The President of a municipality and the Veterinary Assistant Surgeon may issue a certificate under their joint signatures that an animal is fit for slaughter if they are both of opinion (which shall be recorded) that—

(a) the animal is over fourteen years of age and unfit for work or breeding, or

(b) the animal has become permanently incapacitated from work or breeding due to age, injury, deformity or any incurable disease.

(3) Where there is a difference of opinion between the President of a municipality and the Veterinary Assistant Surgeon as to the issue of a certificate under sub-section (2), the matter shall be referred to the Veterinary Officer and a certificate shall be issued or refused according as both the Veterinary Assistant Surgeon and the Veterinary Officer are of opinion that the animal is fit to be slaughtered or is not so fit.

(4) Where under sub-section (3) a certificate is issued or refused, the order granting or refusing the issue of the certificate shall be signed by the Veterinary Assistant Surgeon and endorsed by the Veterinary Officer.

(5) Any person aggrieved by the refusal to issue a certificate under this section may, within fifteen days from the date of communication to him of such refusal, appeal to the Provincial Government against the order of refusal, and the Provincial Government may pass such orders thereon as it thinks fit.

(6) The Provincial Government may, at any time for the purpose of satisfying itself as to the legality or propriety of any action taken under this section, call for and examine the record of any case and may pass such orders thereon as it thinks fit.

(7) Subject to the provisions of this section, any action taken under this section shall be final and shall not be called in question in any court.

5. *Prohibition of slaughter of animals in places not prescribed for the purpose.*—No animal in respect of which a certificate has been issued under section 4 shall be slaughtered in any place other than a place prescribed in this behalf.

6. *Power to enter and inspect premises.*—(1) For the purpose of enforcing the provisions of this Act, the President of a municipality or the Veterinary Assistant Surgeon or any person, authorised by the Veterinary Assistant Surgeon in writing in this behalf, shall have power to enter and inspect any premises within the local limits of his jurisdiction where he has reason to believe that an offence under this Act has been or is likely to be committed.

(2) Every person in occupation of any such premises as is specified in sub-section (1) shall allow the President of a municipality, the Veterinary Assistant Surgeon or the person authorised, as the case may be, such access to the premises as he may require for the aforesaid purpose, and shall answer any question put to him by the President of a municipality, the Veterinary Assistant Surgeon or the person authorised, as the case may be, to the best of his knowledge or belief.

7. *Penalties.*—Whoever contravenes any of the provisions contained in this Act shall be punishable with imprisonment for a term which may extend to six months, or with fine which may extend to one thousand rupees, or with both.

8. *Offences to be cognizable.*—Notwithstanding anything contained in Code of Criminal Procedure, 1898, all offences under this Act shall be cognizable.

[Act V of 1898.]

9. *Abetments and attempts.*—Whoever abets any offence punishable under this Act or attempts to commit any such offence shall be punished with the punishment provided in this Act for such offence.

10. *Officers exercising powers under this Act deemed to be public servants.*—All Presidents of municipalities, Veterinary Assistant Surgeons, Veterinary Officers and other persons exercising powers under this Act shall be deemed to be public servants within the meaning of section 21 of the Indian Penal Code. [Act XLV of 1860.]

11. *Protection of persons acting in good faith.*—No suit, prosecution or other legal proceeding shall be instituted against any person for anything which is in good faith done or intended to be done under this Act or the rules made thereunder.

12. *Power to grant exemptions.*—The Provincial Government may, by general or special order and subject to such conditions as it may think fit to impose, exempt from the operation of this Act the slaughter of any animal for any religious medicinal or research purposes.

13. *Delegation of functions.*—The Provincial Government may, by notification in the Official Gazette, delegate to any officer of the Provincial Government all or any of its powers or functions under sub-sections (5) and (6) of section 4, or section 12.

14. *Power to make rules.*—(1) The Provincial Government may, by notification in the Official Gazette, make rules to carry out the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for—

(a) the form and manner in which applications for certificates under section 4 shall be made;

(b) the fees payable for any certificate which may be issued under section 4 and the form of such certificates;

(c) the places in which animals may be slaughtered in pursuance of this Act;

(d) the conditions subject to which the slaughter of any animal may be permitted under section 12.

The Schedule

(*See* section 2)

Bulls
Bullocks
Cows
Calves
Male and female buffaloes
Buffalo calves
Castrated buffaloes.

STATEMENT OF OBJECTS AND REASONS

Recently there has been considerable agitation by leaders of public opinion, in the press as well as in the Legislature, against indiscriminate slaughter of cattle, urging that in view of the over-all shortage of efficient cattle, their slaughter should be completely banned. In consideration of the situation the Government of India appointed a committee called the "Cattle Preservation and Development Committee" to go into the question of slaughter of cattle in all its aspects and to recommend a comprehensive plan of action for preservation and development of the cattle wealth of the country. The following recommendations of this Committee were accepted by the Government of India:—

(1) There should be total prohibition of slaughter of all useful cattle, such prohibition, however, not being applicable to—

  (a) animals over 14 years of age and not fit for work and breeding, and

  (b) animals of any age, permanently unable to work or breed owing to age, injury or deformity.

(2) Unlicensed and unauthorised slaughter of cattle should also be prohibited.

The Government of India commended the above recommendations to the Government of West Bengal for acceptance and suggested that these might be given effect to in this province by introducing necessary legislation. In pursuance of this suggestion of the Government of India, the Government of West Bengal have decided to assume powers by legislation to control the slaughter of bulls, bullocks, cows, calves, male and female buffaloes, buffalo calves and castrated buffaloes in the manner recommended by the Cattle Preservation and Development Committee.

The Bill has been framed with this object in view.

APPENDIX No. XVIII

MODEL RULES FOR MEAT INSPECTION AND FOR THE INSPECTION OF SLAUGHTER-HOUSES AND THEIR REGULATION

PART I.—DEFINITIONS

1. In these Rules unless the context otherwise requires,—

(i) "Animal" includes any horse, mare, gelding, pony, foal, colt, filly, stallion, ass, donkey, mule, bull, cow, bullock, heifer calf, steer, ox, sheep, lamb, ewe, whether ram, pig, boar, hog, sow, goat, or kid ;

(ii) "Butcher" means the person producing or dealing with meat intended for human consumption ;

(iii) "Carcases" means the carcases of animals mentioned in clause (i) ;

(iv) "Cattle" includes a bull, cow, ox, heifer, calf, steer, bullock, or buffalo ;

(v) "Condemned" means that carcases, parts or organs so marked unfit for food of man and shall be destroyed for food purposes ;

(vi) "Halal' means the meat prepared according to the religious rites of Mohammedans ;

(vii) "Jhatka" means the meat prepared according to the religious rites of Sikhs ;

(viii) "Local Authority" means the Council, Committee, Corporation, or Panchayat of a municipality, Notified Area, Small Town, or any other local area ;

(ix) "Meat" means flesh or other edible parts of an animal which is sold or intended for sale for human consumption ;

(x) "Meat Inspector" means the Medical Officer of Health, or Veterinary Surgeon or any other officer appointed by a local authority and vested with the power to inspect and examine meat intended for human consumption ;

(xi) "Medical Officer of Health" means any duly qualified Medical practitioner appointed or employed by a local authority or a local Government to act in that capacity ;

(xii) "Nuisance" includes any act, omission, place or thing which causes or is likely to cause injury, danger, annoyance or offence to the sense of slight, smell or hearing, or which is or may be dangerous to life or injurious to health or property ;

(xiii) "Public Street" means any street—

(a) over which the public have a right of way ; or

(b) heretofore levelled, paved, metalled, channelled, sewered, or repaired out of municipal or other public funds.

(xiv) "Slaughter-hall" means the actual place where the animals are slain ;

(xv) "Slaughter-house" means any building, premises, or place used in connection with the business of killing and slaughtering animals intended for human consumption. For the purpose of these rules a slaughter-house may be either a public slaughter-house maintained by the local authority or a private slaughter-house duly licensed for the purpose of slaughtering animals ;

(xvi) "Slaughter-man" means the person who slaughters the animals and dresses the carcases.

(xvii) "Veterinary Surgeon" includes any duly qualified Veterinarian appointed or employed by a local authority or a local government to act in that capacity.

PART II.—PRIVATE AND PUBLIC SLAUGHTER-HOUSE

2. In localities where one or more public slaughter-houses are present, or such that are to be established by local laws, there shall be prohibited—

(a) the establishment of new private slaughtering places ;

(b) a further use of existing private slaughtering places, unless such places are constructed in accordance with the sanitary requirements laid down in Part III of these rules.

3. A local authority may provide, establish, improve, or extend and maintain within or without their area, and two or more local authorities may combine to provide, establish, improve or extend and maintain, one or more public slaughter-houses constructed in accordance with the sanitary requirements laid down in Part III of these rules.

4. In localities where one or more public slaughter-houses that do not conform to the sanitary requirements laid down in Part III of these rules, are present, the local authorities concerned shall make necessary provisions for any changes, extensions or improvements that are in accordance with the aforesaid sanitary requirements. For this purpose a certain percentage of the income from slaughter-houses may be set apart as a reserve and used for extension and improvements or as an alternative local authorities may advance loans as and when required up to a certain percentage of the income realised from the slaughter-houses.

5. In a local area the slaughter-houses for the slaughter of—

(a) cattle,

(b) sheep and goats (*Halal*), and

(c) sheep, goats and swine (*Jhatka*),

and the preparation of meat thereat shall not be within 100 yards of each other.

PART III.—SITE, STRUCTURE AND SANITARY REQUIREMENTS OF SLAUGHTER-HOUSES

6. The premises to be erected or to be used and occupied as a slaughter-house shall not be within 300 feet of any dwelling house or building frequented by the public, and the site shall be such as to admit of free ventilation by direct communication with the external air on at least two sides of the slaughter-house.

7. The slaughter-house shall not in any part be below the surface of the adjoining ground.

8. The approach to the slaughter-house shall not be on an incline of more than one in four, and shall not be through any dwelling house or shop. Any door of the slaughter-hall or cooling room shall not open directly into any street or lane or other public place, and shall not be so situated that the slaughtering of animals can be seen from any public place, public street or from any adjacent dwelling house, or occupied place outside the slaughter-house. A sign board marked "Registered slaughter-house" or "Licensed slaughter-house" shall be placed in front of the building or place used for slaughtering.

9. Every slaughter-hall or cooling-room shall be covered with a proper roof, and no habitable room or loft shall be constructed over the slaughter-house and lairs, pens or stables in connection with the same.

10. Lairs, pens or stables which should be provided for food animals awaiting slaughter in connection with the slaughter-house shall not be within 100 feet of a dwelling place or building frequented by the public; and they shall be properly paved, drained, ventilated and lighted, and water-supply in them should be convenient and adequate for animals awaiting slaughter.

11. No lair or stable in connection with the slaughter-house shall be so situated or constructed that animals within it may see into any slaughter hall or cooling room.

12. The water-supply shall be ample, clean and potable, with adequate facilities for its distribution in the slaughter-house. In addition, the slaughter-house shall be provided with an adequate tank or other proper receptacle for water having a water-tap to which a hose can be readily attached, so placed that the bottom shall not be less than 6 feet above the level of the floor of the slaughter-house.

13. The slaughter-house shall be provided with means of thorough ventilation and abundant light, both natural and artificial. All doors and windows shall be provided with fly proof shutters.

14. The slaughter-house shall be well paved with rough cement concrete or other non-slippery impervious material, and laid with proper slope and channels running towards one or more gullies (which shall be properly trapped and covered with a grating, the bars of which shall not be more than three-eighths of an inch apart) placed immediately outside the slaughter-hall or cooling room to allow of the floor being flushed and drained. The corners of the walls and floor shall be rounded off to prevent the collection of dirt and dust.

For non-sewered towns a cesspool or pit, constructed of non-absorbent material, shall be provided outside the building for the collection of slaughter-house refuse only.

15. The surface of the walls in the interior of the slaughter-house shall be covered with hard, smooth and impervious material to a height of at least 6 feet. White-washing of the walls shall be done at least once in six months.

16. No water-closet, privy or cesspool shall be constructed within the slaughter-house. There shall be no direct communication between the slaughter-house and any stable, water-closet, privy or cesspool except that which is provided for the collection of the slaughter-house refuse.

17. Every practicable precaution shall be taken to keep the slaughter-house free from flies, carrion, rats, mice and other vermin. The use of poisons and rat-viruses for any purpose in rooms or compartments within the slaughter-house premises where meat or meat products are stored or handled shall be forbidden.

18. Every slaughter-house shall be provided with properly located facilities for disinfecting and cleaning utensils, hands and instruments, etc., of all persons handling any meat or meat products.

PART IV.—Regulation of Slaughter-Houses

19. A person, firm, corporation or any officer or agent of any such person, firm or corporation, carrying on the business of a slaughterer of animals shall not use any premises as a slaughter-house without a licence from the local authority.

20. No person shall slaughter or cause or permit to be slaughtered at any place other than a public slaughter-house or premises licensed for the purpose of slaughtering, any four-footed animal the flesh of which may be used as human food:

Provided that this shall not apply for sacrificial slaughter, on the occasion of any festival or ceremony, of animals the flesh of which is not intended for sale; and provided further that the slaughter of such animals shall not be carried out within the sight of public.

21. Every person who may apply to the local authority for a licence for the erection, use and occupation of any premises, as a slaughter-house shall furnish in Form A appended to these rules, a true statement of the particulars therein requires to be specified.

22. Every person to whom the local authority may have resolved that a licence be granted to erect premises for use and occupation as a slaughter-house shall be entitled to receive from the said local authority a licence in Form B appended to these rules, or to the like effect.

23. A fee shall be charged by the local authority for granting every licence or renewal of licence for the erection, use and occupation of premises as a slaughter-house for a period of every 12 months.

24. Licences for the erection, use and occupation of premises as a slaughter-house shall be renewable after a period of every 12 months.

25. A public or a duly licensed slaughter-house shall be kept open for use by the butchers during the summer and winter between such hours each day as decided by the local authority from time to time and the working hours of the slaughter-house heretofore decided shall be conspicuously marked, painted or labelled suitably on or about the entrance gate of the slaughter-house.

26. Every owner or occupier of a slaughter-house shall at all reasonable times, afford free access to every part of such premises to the Veterinary Surgeon, Medical Officer of Health, Meat Inspector, or other person or persons specially authorised by the local authority, for the purpose of inspecting the condition of the premises and the manner in which the business is being carried on, and for examining any carcass or portion thereof, or any animal that may be found therein.

27. No person other than the Veterinary Surgeon, Medical Officer of Health, Meat Inspector, bona fide butchers or their assistants and servants, or any other person or persons especially authorised by the local authority as for example, persons, their staff and merchants duly authorised by them, who are interested in the grading and marking of hides, meat or other animal by-products, shall enter the slaughter-house premises during the process of slaughtering, skinning, dressing or cutting up carcasses.

28. The owner or occupier of every slaughter-house shall cause every animal brought to such slaughter-house for the purpose of being slaughtered, and confined in any pound, stall, pen, lair or stable upon the premises previously to being slaughtered, to be provided during such confinement with sufficient quantity of wholesome water: and if confined for more than twelve hours, to be provided with a sufficient supply of food.

29. Suitable arrangements shall be made for the proper care and food of the animals while in the waiting yard by the owners or butchers at their own expense or by the local authority at the expense of the owners or butchers.

30. The owner or occupier of every slaughter-house shall cause to be maintained, from day to day, a statement in a suitable record book or register showing clearly (a) the number and kind of animals received into the slaughter-house together with the names and addresses of the persons to whom the animals have been consigned, (b) class, age and sex of animal, (c) names and addresses of persons to whom the animals are sold, *i.e.*, the butchers, (d) the fees recovered therefrom, and (e) the results of meat inspection by the Meat Inspector, indicating grade if prescribed: and such a record book or register shall be open to the inspection of the Medical Officer of Health, Veterinary, Veterinary Surgeon, Meat Inspector or other person or persons authorised by the local authority in this behalf.

31. Every owner or occupier of a slaughter-house and every servant of such occupier and every other person employed upon the premises shall carry out the slaughtering work with as little pain or suffering to the animals as practicable, and shall use such instruments and appliances, adopt such methods and otherwise adopt such precautions as may be requisite to secure the infliction of as little pain or suffering as practicable; provided that this requirement shall not interfere with the religious susceptibilities of the persons engaged on the premises.

32. A person shall not, in the slaughter-house slaughter or cause or suffer to be slaughtered, any animal in view of another animal.

33. No animals other than those intended for slaughtering shall be allowed into the slaughter-house and no animal shall be kept in a slaughter-house for a longer period than may be necessary for preparing such animal for slaughter, and such period shall in no case exceed three days.

34. No animal which has been received into slaughter-house for the purpose of being slaughtered, shall be removed from the slaughter-house before being slaughtered, except with the consent of the Meat Inspector, Veterinary Surgeon or the Medical Officer of Health.

35. No animal shall be slaughtered except inside a slaughter-hall, or booth meant for the purpose.

36. The owner or occupier of a slaughter-house shall provide adequate number of hangers or pulleys for hanging the carcases and facilitating dressing of the slaughtered animals.

37. An owner or occupier of a slaughter-house shall not cause or allow any blood or other refuse to flow from the slaughter-hall so as to be within the sight of any animal in the slaughter-house.

38. No air shall be blown by the mouth or in any other manner into the tissues of any carcass or part of a carcass slaughtered or prepared for human consumption.

39. The means of ventilation, drainage and lighting of every slaughter-house shall be kept in good and efficient order to the satisfaction of the local authority.

40. Every owner or occupier of a slaughter-house shall cause the means of water supply provided in or in connection with slaughter-house to be kept, at all times, in proper order and efficient action as may be approved by local authority, and shall provide for use on the premises a sufficient supply of clean water for the purpose of thoroughly washing and cleansing the floor or pavement, every part of the internal surface of every wall of such slaughter-house, and every utensil, vessel or receptacle which may be used for the collection and removal from such slaughter-house of any blood, manure, garbage, filth or other refuse products of slaughtering or the dressing of any carcass on the premises.

41. (a) Every owner or occupier of a slaughter-house shall provide a sufficient number of vessels or receptacles, properly constructed of galvanized iron or other non-absorbent material, and furnished with closely fitting covers, for the purpose of receiving and conveying from such slaughter-house all manure, blood, garbage, filth, or other refuse products of the slaughter-house.

(b) All blood, manure, garbage, filth or other refuse from any animal slaughtered and the hide, fat, viscera and offal therefrom, shall be removed from the slaughter-house within 8 hours after the completion of the slaughtering of such animal, and in such manner and by such means as will not cause nuisance at the premises or in the public streets or elsewhere and as may be approved by the local authority.

(c) Every owner or occupier of a slaughter-house shall cause every such vessel or receptacle to be thoroughly cleansed immediately after such vessel or receptacle has been used for such collection and removal, and shall cause every such vessel or receptacle, when not in actual use, to be kept thoroughly clean.

(d) In a public slaughter-house any skin or entrails or offal not removed within the allotted time shall become the property of the local authority and shall be disposed of by them in such manner as deemed fit, provided that if they so prefer, they may delegate to the officer-in-charge of the slaughter-house power to have such skins, entrails or offal removed at the owner's or butcher's expense and the officer in charge may refuse to such butcher or owner or his servant any subsequent admission to the slaughter-house until such expense is made good to the local authority.

42. (a) Every owner or occupier of a slaughter-house shall cause every part of the internal surface of the walls and every part of the floor and pavement of such slaughter-house to be kept at all times in good order and repair, so as to prevent the absorption therein of any blood or liquid refuse or filth which may be spilled or splashed thereon, or any offensive or noscious matter which may be deposited thereon or brought into contact therewith.

(b) Every part of the internal surface above the floor or pavement of such slaughter-house shall be washed thoroughly with hot lime-wash at least once in every month.

(c) Every part of the floor or pavement of such slaughter-house, and every part of the internal surface of every wall on which any blood or liquid refuse or filth may have been spilled or splashed or with which any offensive or noxious matter may have been brought into contact during the process of slaughtering, dressing and cutting up in such slaughter-house, shall be thorougly washed and cleansed within three hours after the completion of such slaughtering or dressing.

43. An owner or occupier of a slaughter-house shall not at any time keep any dogs, pigs or birds, or cause or suffer any dogs, pigs or birds to be kept in or to have access to such slaughter-house. The

open area in a slaughters-house shall be covered by wire rope netting to prevent carrion birds from carrying away the material and dropping it in the vicinity of the inhabited area.

44. No person shall create any disturbance in the slaughter-house premises. Any person contravening this rule may be removed summarily under the direction of the Veterinary Surgeon, Medical Officer of Health, Meat Inspector or any other person appointed or employed by the local authority as in charge of such a slaughter-house.

45. No person affected with tuberculosis, or any other infectious or contagious disease, leprosy, sores or any skin disease shall enter the slaughter-house. A periodical medical inspection of butchers and flayers shall be obligatory.

46. No person shall rub or cause to be rubbed the inner sides of skins upon the ground within any portion of the slaughter-house. Hides and skins shall not be dragged within the slaughter-house premises except on the hair side.

47. No gut-scraping, tripe cleaning, manufacture or preparation of articles of food for man or for animals, household washing or work of any nature, other than is involved in the slaughter and the dressing of carcases, shall be permitted in any slaughter-house except in the adjuncts to the slaughter-house intended for these purposes.

48. Fees shall be levied by the local authority for each animal slaughtered in a public slaughter-house.

PART V.—Duties of Butchers Slaughter-men*

49. Evidence of disease in a carcass shall not be modified or obliterated by washing, rubbing, stripping or in any other manner, except under the direct supervision of the Meat Inspector and in accordance with his instructions.

50. In no case shall the serous membranes (pleura and peritoneum) be stripped, except by or under the direction of the Meat Inspector, and in any such case in which immediate stripping is necessary to preserve the marketability of the carcass the membranes shall not be entirely detached from the carcass until the same have been examined by the Meat Inspector and he has authorised detachment.

51. Notification of intention to slaughter animals for emergency reasons shall be forwarded to the Veterinary Surgeon, Medical Officer of Health or Meat Inspector, and so far as practicable all such animals shall be examined at the time of slaughter. If not so examined the carcass, with the whole of the viscera and all parts thereof attached thereto, shall be detained until examined by the Meat Inspector.

In cases where such an animal is examined at the time of slaughter, the Meat Inspector may require the carcass, the whole of the viscera and all parts thereof, unless obviously unfit for food, to be detained for 24 hours thereafter to enable a later inspection to be made.

All carcasses of such animals as may subsequently be passed for human consumption shall be ribbed or quartered before being released.

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*For effectively carrying out the provisions laid down in rules in part V it is necessary that butchers and flares should be licensed.

52. Any cloth or instrument that has been used on a tuberculous carcass or parts thereof, or on a carcass presenting lesions of other disease or suspected of being diseased, shall not again be used until it has been boiled for half an hour in water containing soda.

53. Where the carcass has not been examined by the Meat Inspector at the time of slaughter, the whole of the viscera, parts and organs thereof shall be kept, pending inspection, in such a way as to enable them to be identified, by labelling, or otherwise, with the carcass from which they have been removed.

54. No carcass or part thereof shall be removed, or, so placed as to prevent its ready identification, except with the authority of the Veterinary Surgeon, Medical Officer of Health or Meat Inspector.

PART VI.—GENERAL DUTIES OF AND INSTRUCTIONS TO MEAT INSPECTORS.

55. It shall be the duty of the Meat Inspector appointed by the local authority in this behalf :—

(a) to attend at the slaughter-house during the hours fixed ;
(b) to inspect animals ante-mortem according to the provisions in Part VII of these Rules ;
(c) to inspect animals post-mortem according to the provisions in Part VIII of these Rules ;
(d) to keep a record of the number and kind of animals slaughtered along with the number and kind of carcasses, parts and organs condemned for different diseases ;
(e) at the close of each day's work to see that the slaughter-house or slaughter-houses under him are thoroughly cleansed and disinfected and the condemned parts and organs duly destroyed and the offal removed to such places as may be appointed by the local authority ;
(f) generally to enforce the provisions of these Rules.

56. Every effort shall be made to inspect the carcasses and viscera of all animals slaughtered. This examination shall be methodical and as complete as possible in all cases.

57. (a) The Meat Inspector shall have his own knives, wipes and instruments for examining carcasses and parts and organs thereof.

(b) Knives and other instruments that have been used for cutting or examining any diseased organ, gland or tissue shall not again be used for any purpose until they have been disinfected in boiling water or other suitable disinfectant.

58. The carcass of an animal that is free from disease, and the carcasses and organs which are well nourished, shall be passed, without any undue mutilation, as fit for human consumption.

59. When all portions unfit for human food have been removed from a carcass under the supervision of a Meat Inspector, the remainder of the carcass shall be passed as fit for human consumption.

60. If disease is found in any part of a carcass or in any organ, the whole carcass and all the organs thereof shall be examined for evidence of any repetition of the local condition, or modification of the same in other parts, according to the plan outlines in Part VIII of these Rules.

PART VII.—ANTE-MORTEM INSPECTION.

61. Where practicable it is desirable that all animals shall be inspected before slaughter, the object being to ascertain that each animal, which it is intended to slaughter, is in a satisfactory state of health. In cases of doubt as to the health of the animal the Meat Inspector shall notify the Veterinary Surgeon, if one has been appointed for that purpose, and his instructions will be observed. Where ante-mortem inspection of animals is not practicable or has not taken place, the butcher shall notify the Veterinary Surgeon or the Medical Officer of Health or Meat Inspector in any case in which he has doubt as to the health of the animal. Immediate steps shall be taken to have the animal examined before slaughter.

62. Such ante-mortem examination shall be made on the premises of the slaughter-house in which the animals are about to be slaughtered and should include:—

(a) examination for evidence of cruelty to animals by over-trucking, over-driving or by other act;

(b) examination for the detection of animals in very emaciated condition or affected with disease in any form.

63. All stock showing signs of pregnancy shall be rejected and removed from the slaughter-house after being marked with some distinguishing mark.

64. No animals with young at foot shall be permitted to be slaughtered.

65. No stock in a febrile condition shall be slaughtered for human consumption in any slaughtering place.

66. No stock showing ante-mortem symptoms of disease or suspected of being diseased shall be slaughtered until all other stock intended to be slaughtered at the slaughter-house on the same day have been slaughtered.

PART VIII.—METHOD OF EXAMINATION OF CARCASES

67. The following instructions indicate the order and method of inspection of all carcases:—

SECTION I. *General Principles to be observed.*

1. *Viscera:*—

(a) All viscera shall be examined as they are removed from the carcase or in such circumstances as will ensure that they are the viscera of a particular carcase.

(b) Every organ and the associated lymph glands shall be examined by the eye and by palpation. When any abnormal condition is observed, the nature and significance of which cannot be determined by such examination, the organ or gland shall be incised and the incision shall be made in such manner as to avoid soiling or contaminating or unnecessarily depreciating the value of any part of the carcase or other organs that may be passed fit for human food.

(c) The efficient examination of lymph glands shall be by multiple incisions into their substance.

2. *Carcase:*—

(a) The carcase shall be examined for—

(i) evidence of bruising, haemorrhage or discolouration;

(ii) local or general dropsy (oedema);

(iii) swellings or deformities of bones or joints or swellings or other abnormality in the musculature.

(b) The serous membranes (pleura and peritoneum) shall be examined in every case, and in no case shall they be removed nor shall any evidence of disease be modified or obliterated by washing, rubbing, stripping, or in any other manner before examination.

(c) After the carcase is split, the sternum, ribs, vertebrae and spinal cord shall be examined.

(d) Incision to be made on each quarter in the musculature near the shoulder joint and near the public bone, without mutilating the carcase, for detection of cysts (Cysticercus bovis and cellulosae).

SECTION II.—*Detailed Instructions for Routine Inspection of carcasses of Cattle and Swine.*

1. *HEAD.*—The head, including (a) the surface of the tongue (which should be loosened but not detached before examination), (b) the palate or roof of the mouth, and (c) the lymph glands of the throat (netro-pharyngeal sub-maxillary and parotid) shall be examined by the eye and palpation, and the cheek muscles shall be examined on both sides by a linear incision parallel with the branches of the lowest jaw.

Note.—In the case of calves, lymph gland of the head shall only be cut in cases of suspicion.

2. *Abdominal cavity.*—

(a) *Stomach, Intestines and Spleen.*—The outer, and when necessary the inner, surfaces of the stomach and intestines, and the surface and substance of the spleen shall be examined, together with the glands of the stomach and bowel (gastro-splenic and mesenteric) and the web (omentum). The spleen shall be cut where necessary, for the examination of the substance (pulp).

(b) *Liver.*—The surfaces and substance of the liver shall be examined. The associated lymph glands (hepatic) shall also be examined and the bile ducts incised where necessary.

Note.—In the case of calves, the cutting of bile ducts may be omitted.

(c) *Kidneys.*—The lymph glands of the kidneys (renal) and the adrenal glands shall be examined before the removal of the kidneys. Thereafter the kidneys shall be exposed, and the surface examined and, if necessary, the kidneys shall be split by incision and the substance examined.

(d) *Uterus and Ovaries.*—The inner and outer surfaces of the uterus, and the substance of the ovaries shall be examined. Where necessary the uterus shall be cut transversely through both horns, and also longitudinally.

(e) *Urinary Bladder.*—The outer and inner surfaces of the urinary bladder shall be examined by observation and by cutting only if it shows a diseased condition.

Note.—In reporting upon lesions included in paragraphs 2(a), 2(b) and 2(d) special attention shall be paid as to whether the lesions affect the peritoneal surface or the organ itself. Unless care in this connection is evinced statistical records become misleading.

3. *Thoracic Cavity.*—The contents of the thoracic cavity shall be examined before the various organs are separated from each other, and the following examination shall be made:—

(a) *Lungs.*—The lungs shall be examined by the eye and by palpation, and, unless obviously diseased they shall be incised at the base. The associated lymph glands (bronchial and mediastinal) shall also be examined, and unless obviously diseased shall be incised.

Note.—In reporting upon lesions included in paragraph 3(a), distinction shall be made between lesion affecting the pleura and those affecting the lung (parenchyma).

(b) *Heart.*—The heart sac (pericardium) shall be opened, and the heart examined and if necessary incised.

Note.—In reporting upon lesions in paragraph 3(b) distinction shall be made between lesions of the pericardium, myocardium and endocardium.

4. *Udder.*—The udder shall be examined by observation and palpation, incisions shall be made at the base of the teats, and also into any indurated region in the substance of the gland; the associated lymph glands (supramammary) shall also be incised.

5. *Testicles and penis.*—The other surface and the substance of the testicles and penis and the superficial inguinal lymph glands shall be examined.

6. *Serous Membranes.*—The lining (serous) membranes of the chest and abdomen (pleura and peritoneum) shall be examined in every case.

Note.—1. It will be observed that in all cases the following lymph glands must be examined as a matter of routine, *viz.*, (1) Retropharyngeal (in bovines) and submaxillary (in swine); (2) bronchial and mediastinal, (3) hepatic, and (4) mesenteric.

2. In the case of a calf, special attention shall be paid to the navel and to the joints of the carcase.

SECTION III.—*Detailed Instructions for Routine Inspection of carcases of sheep and goats.*

The examination is conducted on the same lines as for calves in Section II. The cutting of the heart, head, pulmonary lymph glands and body lymph gland shall be undertaken only in cases of suspicion.

SECTION IV.—*Detailed Instructions for Routine Inspection of Carcases of Horses, Mules and Donkeys.*

The inspection is conducted on the same lines as for cattle in Section II, but a thorough examination of the nasal mucous membranes shall be made and the head split up longitudinally, and the septum nasi taken out in every case.

SECTION V.—*Instruction as to Additional Inspection where evidence of Tuberculosis has been discovered in Cattle and Swine.*

Where, as a result of inspection in accordance with Section II, evidence of tuberculosis has been detected, the carcase and viscera shall be examined in accordance with the following instructions:—

1. The viscera and the associated lymph glands shall be examined for evidence of tuberculosis both in the substance and in the covering membranes (capsules). *The existence of tuberculosis in the lymph gland of an organ, shall be held to be evidence of the disease in the organ.*
2. All the usual lymph glands which are examined in meat inspection work (other than those already enumerated), *viz.*, the lower cervical, pre-sternal, sub-dorsal, prescapular, supra-mammary (or superficial inguinal), iliac and sub-lumbar glands; and if considered necessary, the precrural and popliteal glands shall be exposed and examined by incision in every case of tubercle. Those glands which, having regard to visible evidence, are least likely to be infected shall be examined first, *e.g.*, if evidence of tuberculosis is found on the pleura the glands of the hind quarter shall be examined before those of the forequarter.
3. The carcase of a pig in which lesions of tuberculosis are found in any situation or in any degree shall be split and the vertebrae examined. The kidneys in such a carcase shall be freed, but not necessarily detached from the enclosing fatty tissue, the surface shall be carefully examined, and if lesions are obvious or suspected, incisions shall be made into the substance.

SECTION VI.—*Instructions as to the action to be taken in the event of evidence of tuberculosis in Cattle and Swine.*

A. *Organs.*—An organ shall be seized when tuberculosis exists on its capsule, or in its substance or in the associated lymph glands.

B. *Head.*—The head, including the tongue, shall be seized if any of the lymphatic glands of the head are affected.

C. *Carcase.*—1. The entire carcase and organs and parts thereof shall be seized when the following conditions are found:—

(a) Tuberculosis with emaciation.

(b) Generalised tuberculosis.

Note.—In determining whether the disease is generalised, the judgment shall be based on the sum of the evidence of disease throughout the entire carcase and organs. The following conditions shall be regarded as evidence of generalisation:—

(i) Miliary tuberculosis of both lungs.

(*Note.*—This is subject to the following qualifications: In minor instances of miliary tuberculosis of the lungs, without evidence of tuberculosis elsewhere and provided the miliary tubercles are not numerous and not of recent origin, it may be possible to pass the carcase. But miliary tuberculosis in the lung even in such a case is evidence of previous systemic infection, and the decision as to whether such a carcase should be condemned shall devolve upon the Veterinary Surgeon or the Medical Officer of Health).

(ii) Where lesions are multiple, acute and actively progressive.

(iii) Where there is multiple and widespread infection of the carcase lymph glands.

(iv) Where there are diffuse acute lesions of both serous membranes (Pleura and peritoneum) and any of the carcase lymph glands are enlarged or contain visible tuberculous lesions.

(v) Where, in addition to the presence of tuberculosis lesion in the respiratory or digestive tracts, there are also lesions present in the substance of any of the following; spleen kidney, udder (or uterus or ovary), testicle, brain and spinal cord or their membranes.

Note.—Notwithstanding this instruction instances may be found where it would be justifiable to pass the carcase after condemnation of the affected organ. Absence of signs of activity, such as calcification or definite encapsulation would be favourable indications. The decision as to whether such a carcase should be condemned shall devolve upon the Veterinary Surgeon or the Medical Officer of Health.

(vi) Congenital tuberculosis in calves.

2. All cases of tuberculosis not included in the immediately foregoing instructions shall be regarded and treated as localised lesions, and the parts containing the lesions and contiguous thereto shall be condemned.

3. If an organ or portion of a carcase becomes contaminated by tuberculosis material, it shall be treated as if it were a case of localised tuberculosis.

SECTION VII.—*Instructions as to the action to be taken in the event of evidence of other disease being found in carcases of Cattle, Sheep Goats or Horses or Swine.*

A. The entire carcase and all the parts and organs and also the blood thereof, shall be and seized if evidence of any of the following conditions is found:—

1. Actinomycosis (generalised).
2. Anaemia (if pronounced).
3. Anthrax.
4. Blackleg.
5. Bruising, general extensive and severe, with or without gangrane.
6. Systicercus bovis (measly beef), if generalised in the meat substance.
7. Cysticercus cellulose (measly pork) if generalised in the meat substance.
8. Decomposition (general).
9. Dourine.
10. Dropsy (general).
11. Emaciation, general, pathological (associated with disease).
12. Epizootic lymphangitis.
13. Erysipelas, acute, swine.
14. Fever (acute).
15. Foot-and-mouth Disease (acute).
16. Glanders (or farcy).
17. Haemorrhagis septicaemia.
18. Immaturity, stillborn or unborn carcases.

   Note.—A carcase shall be considered too immature to produce wholesome meat if—

   (a) the meat has the appearance of being water-soaked, is loose, flabby, tears easily, or can be perforated with the fingers; or

   (b) its colour is greyish red; or

   (c) good muscular development as a whole is lacking, especially noticeable on the upper shank of the leg where small amounts of serous infiltrates or small oedematous patches are sometimes present between the muscles; or

   (d) the tissue which later develops as the fat capsule of the kidneys is oedematous, dirty yellow or greyish red, tough and intermixed with islands of fat.

19. Jaundice (pronounced).

20. Johne's Disease (accompanied by emaciation or anaemia).
21. Lymphadenitis, caseous.
22. Malignant catarrhal fever.
23. Malignant neoplasms—unless localied, in situation and effect, to one organ.
24. Mammitis, acute and septic.
25. Melanosis, generalised—or any generalised pigmentation.
26. Metritis, acute septic.
27. Parturition (carcases of animals having within seven days given birth to young).
28. Pericarditis, septic.
29. Pneumonia, gangrenous.
30. Pyaemia, including joint-ill or umbilical pyaemia.
31. Rabies.
32. Rickets with malnutrition.
33. Rinderpest.
34. Sarcocysts, if generalised in the musculature and visible to the naked eye.
35. Septicaemia, or septic intoxication.
36. Swine fever.
37. Surra.
38. Tetanus.
39. Trichinosis.
40. Tumoura, multiple in musculature.
41. Uraemia (a carcase having a urinous odour).

B. In all cases in which evidence of disease not enumerated in Section VII-A above is found, the organ or portion of the carcase or (organs or portions of the carcase) affected by the disease, and the organs or portions contiguous thereto, shall be condemned.

C. Flesh or organs or carcases falling under one or more of the following conditions which render them unwholesome, unsound or otherwise unfit for human consumption, shall be condemned :—

1. Diseased conditions caused by bacteria which are pathogenic to the human subject.
2. Diseased conditions caused by animal parasites (resident in edible parts) that are pathogenic to the human subject.
3. The presence of poisonous substances in the flesh. Such poisons may be (i) bacterial poisons or toxins generated in the living body by pathogenic bacteria, or produced *post-mortem* by putrifactive bacteria, or (ii) mineral or vegetable poisons introduced into the living animal, or added to the flesh as a preservative after death.
4. Structural alterations that render the flesh, organs or the carcase unsightly or otherwise repulsive in appearance.
5. Conditions that render the flesh innutritious.

PART IX.—MEAT MARKING

68. A local authority may authorise the use of abbreviations of marks of inspection, and such abbreviations shall have the same force and effect as the respective marks for which they are so authorised to be used. This marking shall be made on the spine of the animals and not on the thigh. No meat shall be auctioned or sold without the mark referred to above and such mark or marks shall specify the grade (when prescribed) and the class of the animal slaughtered.

69. No person shall affix or place or cause to be affixed or placed, the inspection marks, copy or representation thereof, to or on any meat or product except the Meat Inspector authorised by the local authority.

70. The ink used for the purpose of meat marking shall be indelible and non-poisonous; and all instruments and marking articles shall be used only by the Meat Inspector himself, and when not in use shall be kept in the safe custody of the Meat Inspector under lock and key.

71. Carcases or parts and organs thereof found by the Meat Inspector on examination to be fit for human consumption shall be marked "Passed" along with an identifying mark for the kind of meat, such as—

(a) G for Goat-flesh,

(b) M for Mutton,

(c) H for Horse-flesh,

(d) P for Pork,

(e) B for Beef from Cows, Bulls, Oxen, Heifers, Calves and Steers,

(f) BF for Buffalo-flesh, and

(g) any carcase, or part or organ thereof found by the Meat Inspector on examination to be diseased or otherwise unfit for human consumption shall be marked "Condemned".

72. All 'Condemned' carcases, parts or organs shall be seized by the Meat Inspector and denatured with crude carbolic acid or other prescribed agent, or destroyed by incineration.

73. If the Meat Inspector deems it necessary to hold any carcase or part thereof for further examination, he shall mark the same "Held".

Should the subsequent inspection show the carcase or any part thereof to be in any way unfit for food, the Meat Inspector shall at the time of such subsequent inspection mark such a carcase or portion thereof as "Condemned" and deal with the same in accordance with the provisions of rule 72.

PART X.—TRANSPORT AND HANDLING

74. Every carcase or part or organ thereof on removal from the slaughter-house, shall if covered in or along a public street or other public place, be suitably and sufficiently covered so as not to be open to the public eye. The conveyance shall be such that the meat is well ventilated, but at the same time invisible. The carcases should be hung on hooks and not dumped. The conveyance if closed, shall be sealed, after loading and the seal broken by the authorities of the local body before unloading.

75. Every person who conveys or causes to be conveyed any meat in a vehicle:—

(a) shall cause to be kept clean the inside and the covering of the vehicle, the receptacles in which the meat is placed, and such parts of any slings or other implements or apparatus used for loading or unloading as come into contact with the meat or its covering; and

(b) if the vehicle is open at the top, back or sides, shall cause the meat to be adequately protected by means of clean cloth or other suitable material;

(c) shall not permit any live animal or any other article to be conveyed in the vehicle at the same times as meat.

76. A person engaged in the handling or transport of meat:—

(a) shall not permit any part of the meat to come into contact with the ground; and

(b) shall take such other precautions as are necessary to prevent the exposure of the meat to contamination.

PART XI.—SALE OF MEAT SHOPS AND STALLS

77. No carcase, portions or organs thereof other than those duly inspected and found fit for human food and bearing the mark "Passed" by the Meat Inspector, shall be sold to the public or exposed for sale at any meat shop or stall.

78. No meat shall be sold or exposed for sale within the limits of a local area except at the shops and stalls, or other premises licensed for the purpose by the local authority.

79. All meat shops and stalls in which it is intended to sell or expose for sale meat of any kind shall be licensed by the local authority on the payment of the fee to be fixed by the local authority.

80. The licences for meat shops and stalls shall be renewed after every twelve months and a renewal fee shall be charged by the local authority.

81. A person selling meat or exposing or offering meat for sale from shop or stall:

(a) shall keep his name and address legibly painted or written on such shop or stall in some conspicuous position, along with the kind of meat in which he may be dealing;

(b) shall cause such shop or stall (if not placed in an enclosed and covered market place) to be suitably covered over and to be screened at the sides and back thereof in such a manner as to prevent mud, filth, or other contaminating substances being splashed or blown from the ground upon any meat on the shop or stall;

(c) shall cause every counter, slab, vessel or other articles on or in which meat is placed for sale and all knives and other implements used in connection with the meat to be thoroughly cleaned after use and to be kept at all times in a clean condition;

(d) shall take all such steps as may be reasonably necessary to guard against the contamination of the meat by flies;

(e) shall not place or cause to be placed any meat on, or within eighteen inches of the ground or floor, unless the meat is placed in a closed cupboard or other adequately protected space not less than nine inches from the ground or floor;

(f) shall cause all trimmings, refuse and rubbish to be placed in properly covered receptacles kept for the purpose apart from any meat intended for sale.

82. The occupier of any room in which any meat is sold or exposed for sale or deposited for the purpose of sale or of preparation for sale or with a view to future sale, and any persons who knowingly lets any room or suffers any room to be occupied for such purpose, shall cause the floors, walls and ceiling of such room to be white-washed and cleansed as often as may be necessary to keep it in a clean and proper state.

83. The occupier of any stall or shop in which meat is sold or exposed for sale shall not supply to any purchaser any meat that is not of the nature, denomination, quality and type demanded by the purchaser.

84. No meat sold at shops or stalls licensed for the purpose shall contain any deleterious substance, drug, dye or preservative.

85. Halaled meat and Jhatka meat shall not be put together for sale or exposed for sale in the same shop or stall.

PART XII.—APPOINTMENT OF MEAT INSPECTORS

86. No person shall be appointed a permanent Meat Inspector unless he is a veterinarian who has had not less than a year's course of training in meat inspection in a recognised Veterinary College and passed the examination prescribed thereof.

PART XIII.—IMPORTED MEATS

87. No meat, meat product or edible offal shall be imported from foreign countries into India or from places outside the limits of a local area unless it is accompanied by an Official Meat Inspection certificate' issued by a qualified Meat Inspector, duly appointed for the examination of meat in the export country or State, showing that the meat has been examined and found by *ante* and *post mortem* examinations to be free from disease and suitable for human consumption.

88. All imported meat shall be open to re-inspection by Meat Inspectors, appointed by the local authority or the Local Government, on payment of such import fee and/or examination fee as may be prescribed by such local authority or local Government.

89. Carcases and parts and organs thereof offered for importation into India, from which such tissues as the peritoneum, pleura, lymph glands or the portal glands of the liver have been removed, shall be condemned.

90. Any meat offered for importation into India, which is found upon inspection to be unsound, unhealthful, unwholesome, or otherwise unfit for human food, or to contain any dye, chemical, preservative (other than common salt) or ingredient not permitted by rule 84 shall be condemned.

PART XIV.—EXPORTED MEATS

91. Persons, firms, corporations, or managements in India and their Inspectors are advised to study carefully the regulations and laws appertaining to the importation of meats into Great Britain, Burma, the Dominions and foreign countries, in order that the shipments forwarded may comply strictly with their requirements and thereby remove the possibility of complaints being received by the Government of India regarding the conditions of Indian meats.

92. Persons, firms, corporations, or managements, in India and their Inspectors are advised to study carefully the articles of International Convention of the League of Nations concerning the Transit of Animals, Meat and other products of Animal Origin* before entering into any contract of import or export of any meats with persons, firms, corporations or managements in Great Britain, Burma, the Dominions or Foreign Countries.

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*League of Nations, No official C. 78M. 1935 II B le Mars 1935.

PART XV.—GENERAL

93. With the approval of the State Government any local authority may adopt the whole of this Memorandum, a part or parts, or any Clause or Clauses thereof for operation in the area under its jurisdiction, and may make any changes, alterations or additions to suit their local conditions.

Penalty Clauses

1. If the owner or occupier of a slaughter-house is convicted of an offence under any of the foregoing rules relating to the conduct of business of a slaughter-house given in Part IV of the model rules, the local authority may cancel the licence for such slaughter-house.

2. If any person obstructs an officer in the performance of his duty under any warrant for entry into the premises used as a slaughter-house, he shall, if the court is satisfied that he obstructed with intent to prevent the discovery of an offence under any of the rules relating to the conduct and regulation of business of the slaughter-house, or if he has within twelve months previously been convicted of such obstruction, be punished with imprisonment which may extend to three months or with fine which may extend to five hundred rupees.

3. Any person offending against any of the provisions in Parts IV, V, X and XI of the rules shall, where no punishment is expressly provided, be punished with fine which may extend to twenty-five rupees for the first offence and fifty rupees for the second offence. For the third or subsequent offence, he shall be punished with fine which may extend to one hundred rupees or imprisonment which may extend tc two months.

FORM A

(*See* rule 21)

FORM OF APPLICATION FOR A LICENCE FOR THE ERECTION, USE AND OCCUPATION OF PREMISES AS A SLAUGHTER-HOUSE

To

The ....

....

I, ..., son of ...., caste ...., age .... of .... do hereby apply to you for a licence for the purpose of erection, use and occupation of certain premises as a slaughter-house for a period of .... ; and I do hereby declare that to the best of my knowledge and belief the particulars hereunto annexed contain a true statement of the several items therein set forth with respect to the said premises.

Particulars

1. Boundaries. Area, Description and situation of the proposed site to be erected for use and occupation as a slaughter-house.

2. The owner of the premises : Name, Father's name, Caste, Address and Domicile.

3. Nature and conditions of applicant's tenure of premises : (a) For what term, and whether by lease or otherwise ; (b) whether applicant is sole owner, lessee, or tenant ; or whether the applicant is jointly interested with any other person or persons, and if so, with whom.

4. The species of animals which it is intended to slaughter in the premises ....

5. The method of slaughtering to be adopted, and the names of instruments to be used for the purpose ....

6. Description of the premises :—

   (a) Nature, position, form, superficial area and cubical contents of the several buildings therein comprised ....

   (b) Extent and nature of the paved area in the buildings and material employed in paving ....

(c) Mode of construction of the internal surface of the walls of such buildings and the materials employed in such construction ....

(d) Means of water supply, position, form, material, mode of construction and capacity of the several cisterns, tanks, or other receptacles for water constructed for permanent use in or upon the premises ....

(e) Means of drainage ; position,, sizes, materials and mode of construction of the several drains ....

(f) Means of lighting and ventilation ....

(g) Roofing, doors and gates ....

(h) Whether the slaughter house is fly-proof ....

(i) Means of access for animals to be slaughtered in the premises from the nearest street or public thoroughfare ....

(j) Number, position and dimensions of the several ponds stalls, pens or lairs, provided in the pre mises ....

(k) Number of Animals for which accommodation will be provided in such ponds, stalls, pens or lairs, distinguishing :

1. Cattle ....
2. Sheep and Goats ....
3. Swine ....
4. Horses ....

*Insert the name and address of the Local Authority.

Signature of the applicant.

Permanent Address.

Date ....

Note.—Attach to this application form of the plan of the proposed premises to be used as a slaughter house.

FORM B

(*See* rule 22)

FORM OF LICENCE FOR THE ERECTION, USE AND OCCUPATION OF PREMISES AS A SLAUGHTER-HOUSE

No. of Licence ....

Reference ....

.... *of ....†

Whereas application has been made to us, the ....*, by ...., son of ...., caste ...., age ...., of ...., for a licence for the erection, use and occupation of certain premises as a slaughter house :

Now, we the said ...., do hereby license the said ...., son of ...., caste ...., age ...., of ...., to use and occupy as a slaughter-house the premises whereof the situation, description, etc., are set forth in the particulars hereunto annexed :—

Particulars

1. Situation of the premises to be used and occupied as a slaughter-house ....
2. Description of the premises ....
3. The species of animals for the slaughter of which the premises are to be used as a slaughter-house. ....
4. Method of slaughtering to be adopted. ....
5. Number of animals for which accommodation is provided :—
    (a) Cattle ....
    (b) Sheep and Goats ....
    (c) Swine ....
    (d) Horses ....

Given under the Common Seal of ....

....

Date ....

SEAL

Signature of the Secretary.

....

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* Name and address of the Local Authority.

† Place and district.

APPENDIX No. XIX.

List of important meat markets with approximate quantity of different types of meat handled annually

(In tons)

Market	Quantity handled					
	Beef	Buffalo flesh	Mutton	Goat flesh	Pork	Total
1	2	3	4	5	6	7
Bihar—						
Patna	126	148	1,498		1	1,773
Tatanagar	359	15	92	374	1	841
Ranchi	672	197	44	182	1	1,096
Muzaffarpur	11	137	20	361	3	532
Bhagalpur	324	121	Neg.	162	..	607
Darbhanga	794	49	..	86	..	929
Bombay—						
Bombay city	6,649	1,230	8,500		170	16,549
Madhya Pradesh—						
Jabalpur	20	..	79	295	..	394
Nagpur	583	..	213	351	7	1,154
Raipur	48	..	71	107	..	226
Akola	130	7	13	63	..	213
Burhanpur	221	131	7	29	..	388
Madras—						
Madras	930	1,040	3,450	2,090	40	7,550
Tiruchirapalli	400	50	1,230	450	..	2,130
Madura	360	..	1 410	410	..	2,180
Coimbatore..	210	10	720	40	..	980
Vellore	120	..	380	220	..	720
Rajahmundry	20	220	160	190	..	590
Guntur	40	44	250	270	10	614

APPENDIX No. XIX—*contd.*

1	2	3	4	5	6	7
Punjab (I)—						
Amritsar	..	..	466	345	98	909
Ambala City	..	..	20	78	17	115
Jullundur	..	..	18	266	..	284
Ludhiana	..	..	4	335	9	348
Simla	..	..	67	147	30	244
West Bengal—						
Calcutta (Hogg Market) ..	625	699	462	127	191	2,104
Howrah	489	391	..	..	..	880
Darjeeling	180	70	60	55	50	415
Kurseong	110	40	40	45	30	265
Kalimpong	80	25	30	25	20	180

APPENDIX No. XX.

Market charges at a few important centres

Centre	Species	Market fee	Slaughtering fee	Flaying and dressing charges	Octroi	Brokerage	Conveyance charges	Stall rent per day	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Madras ..	Cattle	1 12 0	0 8 0	Included in slaughtering fee.	..	..	0 8 0	0 13 0	
	Buffaloes ..	1 12 0	0 8 0		..	..	0 8 0	0 13 0	
	Sheep	0 4 0	0 4 0	..	..	..	0 3 0	0 8 0	
	Goats	0 4 0	0 4 0	..	..	..	0 3 0	0 8 0	
	Pigs	0 4 0	0 8 0	..	..	..	0 4 0	1 2 0	
Bombay ..	Cattle	0 12 0	1 8 0	2 0 0	0 2 0	1 0 0	Included in slaughtering fee.	Rs. 120 to Rs. 800 quarterly according to locality, site and size of the stall.	
	Buffaloes ..	0 14 0	15 0 0	2 0 0	0 2 0	1 0 0			
	Sheep	0 2 0	0 4 0	1 0 0	0 0 9	0 6 0			
	Goats	0 2 0	0 4 0	1 0 0	0 0 9	0 6 0			
	Pigs	..	..	..	..	..	..	..	

APPENDIX No. XX—contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Calcutta ..	Cattle	Included in slaughtering fee.	1 10 0	2 0 0	..	..	Included in slaughtering fee.	1 8 0	Slaughtering fee at Calcutta include stallage, feeding and conveyance charges.
	Buffaloes ..		2 10 0	2 4 0	..	..		1 14 0	
	Sheep	..	0 6 6	0 4 0	..	0 3 0	..	1 8 0	
	Goats	..	0 6 6	0 4 0	..	0 2 0	..	0 10 0	
	Pigs	..	0-8-0 to Rs. 2-8-0 according to size.	..	..	..	..	5 0 0	
Nagpur ..	Cattle ..	..	0 8 0	1 0 0	..	..	..	Rs. 25 to Rs. 125 according to the locality site and size of the stall.	
	Buffaloes ..	..	0 8 0	1 0 0	..	..	..		
	Sheep	..	0 4 0	0 3 6	..	..	..		
	Goats	..	0 4 0	0 3 6	..	..	..		
	Pigs	..	0 8 0	1 0 0	..	..	..	..	
Ranchi ..	Cattle	..	0 6 0	1 0 0	..	..	..	0 8 0	
	Buffaloes ..	..	0 6 0	1 8 0	..	..	..	0 8 0	
	Sheep	..	0 2 0	0 4 0	..	..	..	0 8 0	
	Goats	..	0 2 0	0 4 0	..	..	..	0 8 0	
	Pigs	..	..	..	..	..	..	0 8 0	

APPENDIX No. XXI.

Price spread from producer to consumer in different markets.

(In rupees).

	Oxen		Buffaloes		Sheep		Goats				Pigs	
	Madras	Patna (urban)	Madras	Patna	Madras	[illegible]	Madras	Amritsar	Gaya (urban)	Dighwara (rural)	Madras	Dinajpur
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Butcher's cost price per animal ..	[illegible]	60 0 0 (80·2)	50 0 0 (80·7)	75 0 0 (81·1)	20 0 0 (81·6)	22 0 0 (80·4)	25 0 0 (84·8)	15 0 0 (81·3)	12 0 0 (76·5)	13 0 0 (83·3)	40 0 0 (81·0)	40 0 0 (84·[illegible])
2. Market charges paid by butcher. ..												
(a) Octroi ..	..	..	..	..	..	..	..	..	..	..	..	..
(b) Market ..	1 12 0 (2·1) (License fee to Corporation)	..	1 12 0 (2·8) (License fee to Corporation)	..	0 4 0 (1·0) (License fee to Corporation)	..	0 4 0 (0·8) (License fee to Corporation)	..	..	..	0 4 0 (0·5) (License fee to Corporation)	..
(c) Brokerage ..	..	..	..	..	..	..	..	..	..	..	..	..
(d) Others ..	..	..	..	..	..	..	..	0 4 0 (1·4) (Grazing)	..	..	..	..
3. Charges paid by butcher at slaughter-house.												
(a) Slaughter fee ..	0 8 0 (0·6)	0 8 0 (0·7)	0 8 0 (0·8)	0 8 0 (0·5)	0 4 0 (1·0)	0 3 0 (0·7)	0 4 0 (0·8)	0 4 0 (1·4)	0 1 0 (0·4)	..	0 8 0 (1·0)	
(b) Flaying & dressing charges.	..	0 8 0 (0·7)	..	0 8 0 (0·5)	..	0 1 0 (0·2)	..	..	..	..	..	1 0 0 (2 1)
(c) Others ..	..	0 2 0 (0·2) (*Hamali*)	..	0 2 0 (0·1) (*Hamali*)	..	0 1 0 (0·2) (*Hamali*)	..	..	0 1 0 (0·4) (*Hamali*)	..	..	..

APPENDIX No. XXI—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12	13
4. Transport charges from Slaughter-house to meat market.												
(*a*) Lorry, rail, tonga, etc. charges.	0 8 0 (0·6)	0 5 3 (0·4)	0 8 0 (0·8)	0 8 3 (0·6)	0 3 0 (0·7)	0 4 0 (0·9)	0 3 0 (0·6)	..	0 2 0 (0·8) (Headload)	..	0 4 0 (0·5)	..
(*b*) Octroi ..	..	..	..	..	..	..	..	..	..	..	..	..
(*c*) Others ..	..	0 3 0 (0·3) (Cooly)	..	0 6 0 (0·4) (Cooly)	..	..	..	..	..	..	..	..
5. Charges in the meat market												
(*a*) Rent of the stall	0 13 0 (1·0)	0 4 0 (0·3)	0 13 0 (1·3)	0 4 0 (0·3)	0 8 0 (2·1)	0 2 0 (0·5)	0 8 0 (1·7)	0 2 6 (0·8)	0 0 9 (0·3)	0 2 0 (0·7)	1 2 0 (2·3)	0 4 0 (0·5)
(*b*) Spoilage in storage	1 0 0 (1·2)	0 0 6 (Ng.)	1 0 0 (1·6)	0 0 9 (0·1)	0 8 0 (2·1)	..	0 8 0 (1·7)	..	..	..	1 0 0 (2·1)	..
(*c*) Others ..	1 0 0 (1·2) (Pay of attendant) 1 7 0 (1·8) (Sales tax) etc.)	..	1 0 0 (1·6) (Pay of attendant) 1 7 0 (2·3) (Sales tax) etc.	..	1 0 0 (4·1) (Pay of attendant) 0 5 0 (1·3) (Sales tax) etc.	..	1 0 0 (3·4) (Pay of attendant) 0 5 0 (1·1) (Sales tax) etc.	..	..	0 8 0 (2·8)	1 0 0 (2·1) (Pay of attendant) 0 14 0 (1·8) (Sales tax) etc.	..
6. Butcher's profit ..	6 0 0 (7·2)	12 12 9 (17·1)	5 0 0 (8·1)	15 3 0 (16·4)	1 8 0 (6·1)	4 11 0 (17·1)	1 8 0 (5·1)	2 12 6 (15·1)	3 6 3 (21·6)	2 6 0 (13·2)	4 0 0 (8·1)	6 0 0 (12·7)
7. Butcher's selling price	83 0 0 (100·0)	74 11 6 (100·0)	62 0 0 (100·0)	92 8 0 (100·0)	24 8 0 (100·0)	27 6 0 (100·0)	29 8 0 (100·0)	18 7 0 (100·0)	15 11 0 (100·0)	18 0 0 (100·0)	49 0 0 (100·0)	47 4 0 (100·0)
Sale of meat ..	68 0 0	45 0 0	41 12 0	55 0 0	16 8 0	20 0 0	20 8 0	15 12 0	10 8 0	12 0 0	45 0 0	24 0 0
Offals, Head, Liver, Intestines etc.	5 0 0	13 11 6	5 0 0	18 8 0	3 0 0	3 6 0	3 0 0	0 3 0	1 11 0	1 8 0	4 0 0	23 4 0
Skins ..	10 0 0	16 0 0	15 0 0	18 0 0	5 0 0	4 0 0	6 0 0	2 8 0	3 8 0	4 8 0	..	
Horns ..	..	..	0 4 0	1 0 0	..	..	..	..	..	..	..	
Total ..	83 0 0	74 11 6	62 0 0	92 8 0	24 8 0	27 6 0	29 8 0	18 7 0	15 11 0	18 0 0	49 0 0	47 4 0

NOTE.—Figures in brackets represent percentage to butchers selling price.

Nomenclature

Meat is the properly dressed flesh derived from oxen, buffalo, sheep, goats, pigs, rabbits or camels.

Beef is the meat derived from oxen nearly one year of age or older.

Veal is the meat derived from young calf nearly one year or less of age.

Mutton is meat derived from sheep nearly one year of age or older.

Lamb is the meat derived from young sheep one year or less of age.

Pork is the meat derived from pigs.

Cured meat is the product obtained by subjecting meat to a process of salting, by the employment of dry common salt or of brine.

Dried meat is the product obtained by subjecting fresh meat or cured meat to a process of drying, with or without the aid of artificial heat, until a substantial portion of the water has been removed.

Smoked meat is the product obtained by subjecting fresh meat, dried meat, or cured meat to the direct action of the smoke either of burning wood or of similar burning material.

Canned meat is fresh meat or prepared meat, packed in hermetically sealed containers with or without subsequent heating for the purpose of sterilization.

Pork Sausage is chopped or ground fresh pork, with or without species, salt, sugar, etc.

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